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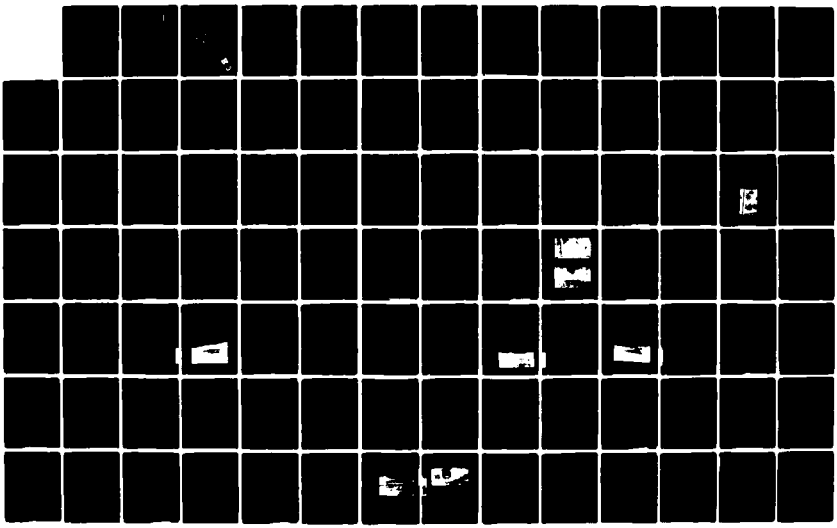

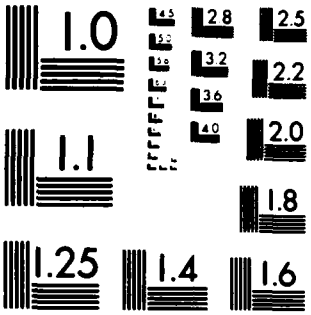

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PINE MOUNTAIN REVISITED

An Archeological Study in the Arkansas Ozarks

by
Neal L. Trubowitz
with a contribution by
Sandra Clements Scholtz

Final Report Submitted to
Little Rock District, U.S. Army Corps of Engineers
DACW03-79-C-0078
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A report on survey and intensive survey of archeological and historic sites which might be impacted by construction of proposed Pine Mountain in the Northwest Ozarks of Arkansas. Includes description of sites first visited and excavated in 1920's and 1930's by M. R. Harrington and S. C. Dellinger.

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PINE MOUNTAIN REVISITED

An Archeological Study in the Arkansas Ozarks

by

Neal L. Trubowitz

With a Contribution By

Sandra Clements Scholtz

ARKANSAS ARCHEOLOGICAL SURVEY
FAYETTEVILLE, ARKANSAS 72701
PROJECT NUMBER 363
June 1980

Report submitted to the Little Rock District
U. S. Army Corps of Engineers, Contract DACW03-79-C-0078

It is by tracing things to their origin that we learn to understand them, and it is by keeping that line and that origin always in view that we never forget them.

COMMON SENSE, by Thomas Paine

Foreword

This volume reports on cultural resource investigations undertaken by the Arkansas Archeological Survey for the U.S. Army Corps of Engineers, Little Rock District, in the area of the proposed Pine Mountain Lake. This investigation is one of several technical studies (including those on wildlife, water quality, socioeconomic impact on the current population, flood control, etc.) which are required by federal law. These reports are used by the Corps of Engineers to determine the overall cost, benefits, and possible negative effects that must be considered when planning such a project.

In 1934 the area was first visited by an archeological expedition from the University of Arkansas, under the direction of S. C. Dellinger, then Curator of the University Museum. His pioneering activities into the archeology of northwest Arkansas during the 1930s informed the archeological community and the public at large of the wealth of cultural information that lay buried in the deposits of the Ozark bluff shelters.

In 1975 the Arkansas Archeological Survey returned to the Lee Creek Valley and conducted a survey for the Little Rock Corps of Engineers District in connection with their plans to construct Pine Mountain Lake.

In 1979 the Arkansas Archeological Survey again was called upon to continue these investigations. The result of this latter work is published in this volume.

The work sponsored by the Corps of Engineers has lead us back into the past, not only into the archeological record of the Lee Creek area, but into the collections and archives of the University Museum.

For the first time in many years the 1934 collections were reexamined and, as a result, several small "spin off" studies were initiated. These studies, which were conducted as an adjunct to the Corps of Engineers' sponsored work, serve to broaden our vision of the archeology of the area. The bluff shelter sites were rich with plant and animal remains, and not all of the earlier cultural material was fully analyzed and reported. Additional analyses on ethnobotanical remains, further ceramic assessments, and an expanded look at reconstructions of the past environments and settlement systems will be forthcoming. A detailed peer review analysis of the 1975 and 1979 projects also is anticipated.

Presently the Arkansas Archeological Survey plans to publish a volume of these volunteered or independently funded studies on the archeology of the Pine Mountain area in a 1981 issue of the Bulletin

of the Arkansas Archeological Society. This publication will be sent to all society members as a benefit of membership and will also be available for purchase by anyone interested in learning more about the archeology of the Lee Creek Valley.

Charles R. McGimsey III
Director
November 20, 1980

Abstract

The 1979 archeological reconnaissance and site testing in the Arkansas Ozarks on upper Lee Creek Valley, Crawford County, Arkansas built upon the research that was done in 1934 by the University of Arkansas Museum and in 1975 by the Arkansas Archeological Survey. As part of the cultural resources investigations for Pine Mountain Lake, 220 acres of lowlands were surveyed, three previously recorded sites were revisited, 10 new archeological loci were discovered and the historic village of Cove City and its cemetery were recorded. Two lowland sites and 15 bluff shelter overhangs were tested, and the location of another shelter was narrowed down to one of two locations. The 1934 collections from the three rock shelter sites were restudied with the first presentation of much of the earlier data. In the first culture-historical reconstruction for the basin, cultural components were found dating between the early Archaic period and the twentieth century. Caddoan peoples probably inhabited the valley and traveled to ceremonial centers downstream, such as Parris Mound, which were connected to the larger Caddoan interaction sphere through the Spiro site in Oklahoma. Various data are described on geomorphology, subsistence, land use, siltstone horticultural tools, and weaving. The 1975 recommendations for further research are integrated with the 1979 results, providing a summary of the status of all cultural resources affected by the proposed Pine Mountain Lake project.

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Management Summary

Project Purpose and History

In response to the mandates of the National Historic Preservation Act, the National Environmental Policy Act, Executive Order 11593, and regulations for the Identification and Administration of Cultural Resources, 33 CFR Part 305 (U.S. Army Corps of Engineers 1978), the Little Rock District of the U.S. Army Corps of Engineers authorized investigations of cultural resources in connection with its proposed Pine Mountain Lake project in Crawford County, Arkansas on upper Lee Creek. These studies are part of the information needed for determining the feasibility and impact on cultural resources of the construction project.

In 1975 the Little Rock District contracted with the Arkansas Archeological Survey (AAS), Contract No. DACW03-76-C-0009, for an intensive survey of archeological and historical resources in the project area, and the results and recommendations of that study have been published by Raab (1976). As landowner refusals of access prevented some of the research from being undertaken at the time of the first study, the Little Rock District again contracted with the AAS in September, 1979 (Contract No. DACW03-79-C-0078) to undertake additional research based on the earlier recommendations.

1979 Project Goals

The 1979 Corps Scope of Services requested that an intensive reconnaissance be completed on approximately 220 acres of lowlands that were not previously surveyed due to lack of access, and that four lowland sites (3CW110, 3CW116, 3CW119, and 3CW127), and three shelter sites (3CW6, 3CW7, and 3CW69) be tested to gather data in order to determine their eligibility for the National Register of Historic Places. New sites recorded in the reconnaissance phase of the research were to be

identified as to location, extent, contents and potential research significance, the impact of the project, and recommendations were to be made for further work as needed.

Constraints on the Field Project

The archeological field research was conducted between October 11 and December 6, 1979. All of the lowland areas were covered by pedestrian surveys in combination with shovel test transects, as the majority of the 220 acres that were surveyed were covered with pasture and woods; very little of these areas could be surface inspected.

Three of the seven sites to be tested could not be investigated as the landowners still refused access (3CW69, 3CW116, and 3CW127); neither the Corps nor the AAS were able to obtain permission for this research.

1979 Study Results

Ten new archeological loci (3CW186 through 3CW195) and the historic area of the village of Cove City (Lee Creek), including its cemetery, were recorded in the lowlands. Three previously recorded sites were also revisited in the reconnaissance (3CW117, 3CW122, and 3CW146) and the data on the limits and contents of those sites were expanded. In the uplands four additional shelters were found beyond those that had been recorded in 1934 and 1975 (at 3CW6 and 3CW7).

Test excavations were conducted at 3CW110 and 3CW119 in the lowlands and at the five shelters of 3CW6, and 10 shelters of 3CW7. The location of 3CW69, which had never before been plotted, was narrowed down to a probable locus on property which could not be investigated in the field.

Significance of the 1979/1980 Research

A variety of data significant to archeological problems was found in the research, including data on culture history, land use, and human behavior. Some of the data collected in 1934 by the University of Arkansas Museum from bluff shelters within the project area was analyzed and is reported here for the first time. The Lee Creek Valley was found to have been occupied since early Archaic times through the twentieth century, with cultural ties to both the Arkansas River Valley and the deeper Ozarks. Caddoan peoples of late prehistory had occupied the Lee Creek Valley. Data was found on small site settlement patterns, the distribution and use of siltstone digging tools, subsistence practices, weaving and cordage manufacturing techniques, mortuary and storage pits, ceramic and lithic types, and local geomorphology. These data were applied against the hypotheses of hunting and agricultural subsystems proposed by Raab (1976).

The diversity of site types and cultural occupations found in the 1979 research provide an all too rare opportunity for sampling different portions of the archeological record within a fairly restricted geographic area.

Management Recommendations

The combined 1975 and 1979 research subjected the entire project area to at least surface reconnaissance and resulted in the identification of over 70 archeological loci within the project area. No further reconnaissance is recommended. On the basis of the data recovered, and whether or not the sites might be impacted by the project (Table 27), it is recommended that 36 sites need no further work (Table 28); further investigations are suggested for 28 archeological sites, one historic village, and five historic cemeteries in order to determine their potential significance. Twelve sites are considered to be eligible for nomination to the National Register of Historic Places on the basis of completed testing.

Disposition of the Research Data

The original written records of the investigation will be maintained by the Arkansas Archeological Survey at its Coordinating Office at the University of Arkansas in Fayetteville. Copies of these records and the artifacts collected in 1979 will be maintained at the Fayetteville Station of the AAS, also at the University of Arkansas.

Acknowledgments

First credit for the research goes to the U.S. Army Corps of Engineers, Little Rock District, for their continued financial support of the research on cultural resources in connection with the Pine Mountain Lake project. Max Witkind, District Archeologist, provided liaison between the Corps and the Arkansas Archeological Survey (AAS), both in the field and administratively.

Many people contributed to the research reported herein. Thanks go to the people of Lee Creek Valley who assisted us by giving permission for the field crew to enter their property and do the work, or provided answers to our questions and a house to rent in the valley. In alphabetical order they are: Emmett and Flora Cluck, Ralph C. Colley, Sr. and Ralph C. Colley, Jr., Charley and Lillian Cox, Martin Cox, John Elkins, Floyd Franklin and sons, John Talent and sons, and Emma Wheeler. Charley and Lillian Cox also donated their collection from 3CW119 to the AAS. Carl Cleavinger of Fort Smith, Arkansas let the AAS examine his collections from 3CW189.

Reexamination of the University of Arkansas Museum collections from the bluff shelter research done in Lee Creek Valley in 1934 was critical to the assessment of some of the sites and also has placed some of this data in print for the first time. Special thanks are extended to Michael Hoffman (Curator of Anthropology), Peggy Hoffman (Curator of Collections and Conservator), Sara Feldbauer (Registrar), and Mary McGimsey (Photographer) for their cooperation and permission to print Museum photographs. Previous research on the 1934 collections was incorporated into this report; Charles Cleland (Department of Anthropology, Michigan State University) gave permission for the use of his original analysis notes on the faunal material and Sandra Clements Scholtz (AAS, Fayetteville) expanded upon her earlier research on the plies found in the shelters.

The laboratory work was directed by Jim Duncan (AAS Laboratory Supervisor, Fayetteville) who also acquired and provided the supplies and equipment for the project. Ann Marie Mires kept the files and all paper records associated with the collections in order and processed and cataloged the artifacts along with Richard Berg, Jack Lax, Doug Marsh, and Peter Mires. Special analyses were done by Charles Hoffman on lithics and Phyllis Marie Clancy on ceramics. Jerry Hilliard (AAS Coordinating Office, Fayetteville) examined and identified the nut remains from the 1934 collections. Leslie Stewart-Abernathy (Pine Bluff Station Archeologist) identified the historic artifacts and Beverly Watkins (AAS Historian) researched historic documents.

The administrative staff of the AAS contract program, including Frank Rackerby (Contract Administrator) and James Toney (Assistant Contract Administrator) kept the project running smoothly. Mary Lynn Kennedy supervised the report production. M. J. Kellett (AAS Artist) prepared all of the artwork with the exception of the ceramic rim profiles, which were done by Phyllis Marie Clancy as part of the ceramic analysis, and Figure 68, which was drawn by an unidentified Works Progress Administration artist. Processing of the field photography and photography of artifacts for the plates was done by Pamela Ashford, AAS Photographer.

Fred Limp (AAS Assistant Director), Mary Printup (AAS Editor), George Sabo III (Fayetteville Station Archeologist), and Gayle Fritz (Fayetteville Station Assistant) provided useful comments on the draft of the report. Sabo and Fritz also provided archeological assistance in visits to the project area and the use of records from the 1975 research in the valley done under the direction of the previous Station Archeologist, L. Mark Raab. Other records were made available by Cathy Moore-Jansen (Survey Registrar) and her staff at the AAS Coordinating Office.

Last, but not least, I thank the field crew on the 1979 research for their endurance of wet, cold, hot, and windy weather, poison ivy, insects, spiders, snakes, and other noxious creatures, clambering up and down the steep valley slopes, cramped living conditions and monotonous menus, and working under me. The crew chief, Robert Cande, and the field assistants, Don Manchester, Carl Merry, and Marshall Sombers, worked long and hard to gather the field information necessary for answering the management and research questions. Their skill and archeological expertise were a prime ingredient in the success of this project.

Of course all of this research was under the purview of C. R. McGimsey III, Director of the AAS. To anyone I have left out of the acknowledgments, I apologize, and I dedicate this report to Wayne Henbest, the first archeologist to work in the Lee Creek Valley as crew chief on one of S.C. Dellinger's bluff shelter survey crews.

Neal Trubowitz
Project Archeologist

Introduction

In 1975 the U.S. Army Corps of Engineers, Little Rock District, contracted with the Arkansas Archeological Survey (AAS) for the identification and assessment of cultural resources that might be impacted by the proposed construction of Pine Mountain Lake on Lee Creek in Crawford County, Arkansas. Archeological reconnaissance and site testing were carried out by the AAS and were reported (Raab 1976); however, due to the denial of property access, the full field investigations could not be completed in 1975.

Under the guidelines of 33 CFR Part 305 (U.S. Army Corps of Engineers 1978) a second contract between the Corps of Engineers and the the AAS (No. DACW03-79-C-0078) for the continued investigation of archeological and historical resources in the Pine Mountain Lake project area was signed in September 1979. The findings of the 1979 AAS investigation of Lee Creek Valley which are reported herein were submitted to the Little Rock District on April 11, 1980.

Under the scope of the contract (Appendix 2) the AAS was to conduct an intensive survey of 220 acres (89 ha) within the proposed reservoir of Pine Mountain Lake that were not accessible in 1975 due to denial of landowner permission. Testing to determine the significance and eligibility of sites for nomination to the National Register of Historic Places was to be conducted on the following sites: 3CW6, 3CW7, 3CW69, 3CW110, 3CW116, 3CW119, and 3CW127. The procedures used to collect and evaluate the sites were to be described in adequate detail to permit review of the research and the resulting conclusions.

PROJECT LOCATION AND ENVIRONMENT

The proposed dam is 35.7 miles (57.45 km) upstream from the mouth of Lee Creek in the Arkansas River Valley at Van Buren, Arkansas,

approximately 15 miles (24.14 km) due north of Van Buren (Figure 1). The dam would cover an area of 2,850 acres (1,153.34 ha) at its maximum flood pool of 851.4 feet (259.51 m) above sea level.

Lee Creek drains a total area of 450 square miles (116,549.46 ha), most of it in Washington and Crawford counties, Arkansas, and the remainder in Adair and Sequoyah counties, Oklahoma. The connecting drainage basins are the Arkansas River on the south, Frog Bayou on the east, Sallisaw Creek to the west, and the White and Illinois rivers to the north.

As discussed in greater detail by Raab (1976), the project lies in the Boston Mountains, part of the Ozark Highlands. The floodplain and terraces of Lee Creek are bordered by steep slopes of sedimentary shale, siltstone, and sandstone. This is part of the Atoka formation of Pennsylvanian age, with the sedimentary beds generally dipping to the south at an angle of about 3 degrees (U.S. Army Corps of Engineers 1979). Differential weathering of this formation has created bluff overhangs and shelters along the slopes.

The modern flora and fauna are typical of the oak-hickory association of the deciduous forest formation. During the field investigations a variety of animals were sighted or indirect evidence was found of their presence. These included birds (sparrow, bluejay, cardinal, roadrunner, owl, buzzard, hawk), reptiles (rattlesnake and grass snake), mammals (opossum, squirrel, red fox, coyote, white-tailed deer, beaver, rabbit), fish, and the tarantula.

At the time of the 1979 investigations most of the lowlands were cleared for pasture and were almost completely overgrown, while the slopes and mountain tops were forested. Local residences were scattered along Route 220 and the dirt road leading through the unincorporated village of Lee Creek (Cove City).

PREVIOUS ARCHEOLOGICAL RESEARCH IN CRAWFORD COUNTY

Institutional archeological investigations were first undertaken in Crawford County in 1932 by field crews from the University of Arkansas Museum under the direction of S. C. Dellinger. In 1934 this work was continued, and the Lee Creek Valley was included in the investigations. Six shelter "sites" and two lowland sites were recorded that year (3CW1, 3CW3, 3CW6, 3CW7, 3CW8, 3CW11, 3CW69, and 3CW70). These early investigations have been the only institutional research in the county done outside of a cultural resource management context, except for the recording of site leads by the Arkansas Archeological Survey.

The 1934 investigations were more thorough than many people have assumed. S. C. Dellinger had brought in Carl Guthe to give brief instructions on archeological methods to his field crews. Grid systems were laid out on the ground (C. Finger, personal communication), and the

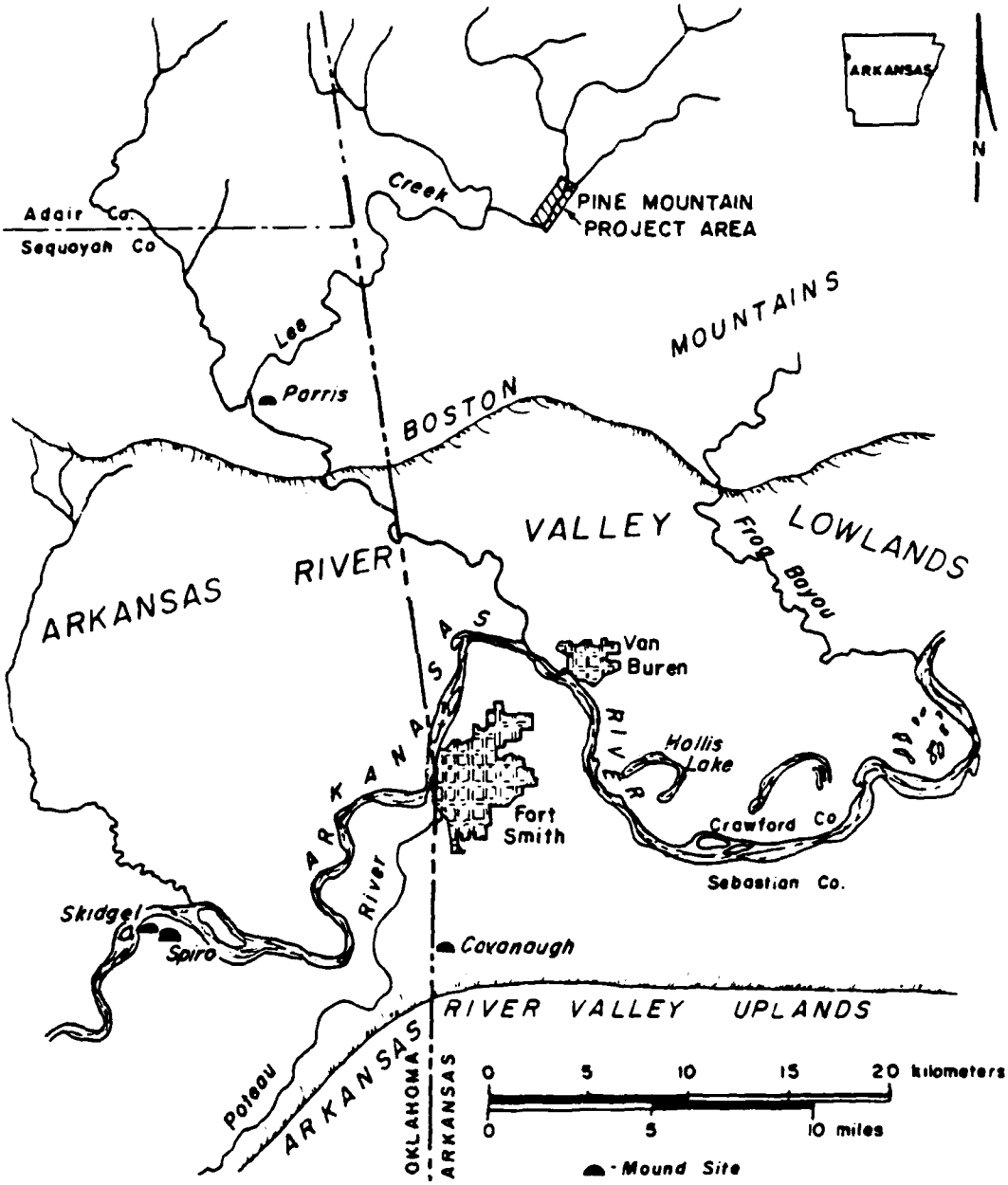


Figure 1. Project location

horizontal proveniences of archeological remains (including artifacts and features) were recorded by a trench/block grid notation, with trenches running the length of the shelters and blocks along the width of them. These collection units were 6 square feet (3.31 m^2). A field catalog was kept by Wayne Henbest who was in charge of the field crew. In his field notes Henbest kept a running account of the archeological materials that were found, recording each item by its trench, block, and the vertical provenience in inches. Sketches were made of some of the features (pits and burials), artifact associations, and impressive individual artifacts. Henbest's larger sketch maps of shelter floor plans were probably made with a plane table.

Some photographs were also taken of shelters and artifacts in situ. Considering the developmental stage that American archeology was in at the time of Henbest's work, he and his crew did an excellent job. One important measure of the value of earlier work is the results of continuing studies; by this measure the 1934 work is worthy indeed. In 1960 Charles Cleland analyzed the original bones from shelters in Lee Creek as part of a M.A. thesis investigating faunal materials in the Ozarks, which was later summarized and published (1965). In 1970 another M.A. thesis by Sandra Clements Scholtz utilized perishables recovered during the 1934 excavations as part of a study of basketry from many shelters in the Ozarks. This too was later published (1975). Downing et al. (1976) prepared a brief summary of the lithics, ceramics, and skeletal material from the Lee Creek shelters as part of the 1975 Pine Mountain report. Material from the 1934 work was also described in reports on ceramics (Dellinger and Dickinson 1942) and baby cradles (Dellinger 1936).

Although a number of articles have included materials from this important earlier work, none have viewed the material on a site by site basis, integrating all of the collected data. Furthermore, it has become apparent that not all of the material recovered had been examined. As a result a significant element of the research reported here is the presentation of an integrated view of the field methods and the spatial associations and identifications of the 1934 materials.

Of course, using the notes of previous investigators, whose research orientations were different than one's own, can often be difficult, and conclusions must be couched with warnings about their reliability. Henbest's specific trench and block designations for the horizontal provenience of the artifacts did not always coincide with those he illustrated on his shelter floor plans. As there was no way of deciding which notation was correct, the tables in this report show his written artifact proveniences while the reproductions of Henbest's maps show the artifact locations as he plotted them with the addition of some material he noted but did not plot.

These figures should be taken as schematic rather than exact depictions of the artifact distribution recovered in the 1934 research. In this report some of Henbest's terminology is retained, even though

he could have been in error, as on the burials which he described as being cremated. His photographs show much more bone intact than is usually found in a true cremation; Henbest may have confused the presence of ash with some of the burials and poor bone preservation as evidence for cremation. The sketches he made in his field book also look more like articulated flexed burials that were badly decomposed and/or disturbed. An examination of the human remains in the Museum collections will have to be made to determine whether or not there was any evidence of cremation on the bones themselves.

In reexamining the materials curated in the University of Arkansas Museum several omissions or errors were found in the previous analyses. At the times when Cleland and Scholtz did their studies, the Pine Mountain shelter materials still remained in the original collection containers and had not been processed into the Museum's tray or box storage system. It was likely that oversights of some of the faunal and basketry materials were due to the unpacked state of the collections. Errors in counting and analysis of the lithics and ceramics were found in Downing et al. (1976) summaries. The 1975 assessment of the 1934 materials came after the collections had been boxed, but apparently the researchers confused the contents of the boxes, sometimes overlooking additional accession numbers, or combined the materials from more than one site. Comparisons between Henbest's field catalog and the materials found in the collection in 1980 indicated that the same material was present in 1980 as in 1975. The major portion of the original 1934 field catalog was available in the Museum's collections in 1980, providing a wealth of data.

Following the 1934 work there was a hiatus of 30 years before the University of Arkansas Museum returned to Crawford County in 1964 and 1965 to work on the Ozark Reservoir Project and interstate highway survey. Between 1974 and 1977 the Arkansas Archeological Survey worked on eight projects in Crawford County (Table 1). This work included pipeline and industrial park surveys, and invesigations in the Lee Creek Valley for the proposed Pine Mountain Lake project in 1975.

In the 1975 Pine Mountain investigations 36 new prehistoric loci were recorded (Table 2), broken down as follows: 19 small bottomland sites, 7 small upland sites, 4 large bottomland sites, and 6 bluff shelters. Eleven historic sites were also recorded (Table 2). Test excavations were done on the six new bluff shelter sites (3CW139, 3CW140, 3CW141, 3CW142, 3CW143, and 3CW151) and one of the sites discovered in 1934 (3CW11). A vegetation survey was also conducted to identify deer browse along a transect on the west side of the Lee Creek basin (Kelley 1976).

Raab posed a variety of research hypotheses regarding seasonal resource utilization (fall-winter deer hunting and spring-summer agriculture) which might be investigated in the Lee Creek basin (Raab 1976). He recommended a multistage schedule of research in connection with the project, including testing the large lowland and bluff shelter sites that the 1975 investigators could not visit, full

Table 1. Professional archeological research in Crawford County, Arkansas

Year	Project	Institution or Firm	Reference
1979	Pine Mountain 2*	Arkansas Archeological Survey	Trubowitz (this report)
1978	Flat Rock Creek & Vache Grasse Creek	Commonwealth Associates Inc.	Commonwealth Associates (1979)
1977	Crawford County Industrial Park Phase II	Arkansas Archeological Survey	Blaylock (1977)
1976	Little Mulberry Creek Watershed Survey	Arkansas Archeological Survey	Brooks (1976)
1976	Van Buren Pipeline	Arkansas Archeological Survey	Taylor (1975)
1975	Pine Mountain 1*	Arkansas Archeological Survey	Raab (1976)
1975	Van Buren Water Supply Site Testing	Arkansas Archeological Survey	Flenniken & Taylor(1977)
1975	Van Buren Water Supply Survey	Arkansas Archeological Survey	Flenniken & Taylor(1977)
1975	Bekaert Steel Wire Corporation	Arkansas Archeological Survey	Rolingson (1975)
1974	Flat Rock Creek Watershed	Arkansas Archeological Survey	Baker (1974)
1965	Interstate Highway Survey	University of Arkansas Museum	Scholtz (1965)
1965	Ozark Reservoir Project	University of Arkansas Museum	Hoffman (1977)
1964	Ozark Reservoir Project	University of Arkansas Museum	Hoffman (1977)
1934	Bluff Shelter Survey*	University of Arkansas Museum	Henbest (1934)
1932	Bluff Shelter Survey	University of Arkansas Museum	Dellinger (1932)

*Research in Lee Creek Valley

Table 2. Sites previously recorded in the vicinity of the Pine Mountain Project

Prehistoric Sites				Historic Sites	
Small bottomland	Large bottomland	Small upland	Bluff shelter		Site Name
3CW115	3CW3	3CW111	3CW1	3CW144	Swearingen Blacksmith Shop
3CW118	3CW8	3CW112	3CW6	3CW145	William Ramey Homestead
3CW121	3CW110	3CW113	3CW7	3CW146	Cotton Gin
3CW122	3CW116	3CW114	3CW11*	3CW147	Elsie Morris Homestead
3CW123	3CW119	3CW117	3CW69	3CW148	Old Shannon Homestead
3CW124	3CW127	3CW120	3CW70	3CW149	Lee Creek Post Office & Stage Stop
3CW125		3CW152	3CW139		
3CW126			3CW140	3CW150	Swearingen Stage Stop
3CW128			3CW141		Spencer Cemetery
3CW129			3CW142		Kimbler Cemetery
3CW130			3CW143		Shamrock Cemetery
3CW131			3CW151		Bryant Cemetery
3CW132					
3CW133					
3CW134					
3CW135					
3CW136					
3CW137					
3CW138					

Note: Sites under 110 were recorded in 1934. Sites 110-152 were recorded in 1975.
*193[illegible] site retested in 1975.

excavation of the threatened bluff shelter sites, and archival and excavation research on historic sites.

The latest professional investigation in the county was a survey of Flat Rock Creek and Vache Grasse Creek carried out in 1979 by Commonwealth Associates for the Soil Conservation Service (Commonwealth Associates 1979). Avocational archeologists have been active in Crawford County, particularly members of the Western Arkansas Chapter of the Arkansas Archeological Society. Chapter members have participated in AAS projects, such as the Van Buren water supply, and have collected on their own. Many sites recorded by avocationalists have not yet been reported to the AAS. Pothunters have also probably been active in Crawford County, searching for dry bluff shelter deposits.

One class of artifact, large percussion flaked bifaces, that have been frequently recovered both by amateurs and professionals in Crawford County has sparked much discussion as to their function and the kind of material they are manufactured from. As Bond (1977:5) noted, the raw material of these bifaces was first described as argillite by Thoburn (1929: 226) in an article on the prehistory of Oklahoma. Arkansas and Oklahoma archeologists have often adopted this term and it appeared frequently in the literature, notably in Hoffman (1965, 1977) where such artifacts were assigned to the Woodland period Gober complex (now called the Gober phase; Hoffman, personal communication). This complex is defined in the Arkansas River Valley east of Van Buren and also included narrow stemmed Gary projectile points and grog-tempered ceramics. Hoffman distinguished the Gober phase from the similar Fourche Maline focus in Oklahoma on the basis of the presence of the argillite "spades or choppers" in the Gober assemblages. Although he noted that there were somewhat similar tool forms made out of quartzite in the Fourche Maline sites, the difference could have been based on the availability of different raw materials for these tool forms.

Based on their form the researchers had assigned assumed functions to these tools for use in prehistoric farming or wood cutting and the tools have been attributed to both the Woodland and Mississippian periods on the basis of this presumed function. Raab (1976) referred to them as "suspected hoes" in his Pine Mountain research, and their presence was integral to the testing of some of his hypotheses concerning spring-summer agricultural subsystems of prehistoric occupation. Since the original Pine Mountain research the first functional analysis of these tools was undertaken and reported by Clell Bond (1977). He replicated some of the different tool forms and experimented with their use, comparing the resulting wear patterns on his replicated tools (with known usage) against prehistoric specimens. Based on form, Bond defined four categories of these tools (Types I-IV), all of which appeared to have been used for working soil, although one category (Type II) might also have been used for working wood. Thus, the association between the tools and agricultural practices was reinforced, although they might also have been used for grubbing for roots, other plant material, or insects and small mammals that burrow.

More recently the question of the raw material from which these tools were manufactured was reassessed (Mires and Duncan 1980) with some of the material collected in the 1979 research. Artifacts from 3CW119 were examined by Dr. W. Manger of the Geology Department, University of Arkansas, under a microscope after applying hydrochloric acid to a small surface on the artifacts. "He observed that these examples were a siltstone grading into a very fine sandstone"(Mires and Duncan 1980:1). Argillite is a metamorphic rock, while siltstone is a sedimentary one, with the major criterion for distinguishing the two material being grain size, with that of siltstone larger than argillite. Most of the material that previous researchers have termed argillite in the southern Ozarks and Arkansas River Valley is probably actually siltstone; siltstone is found in sedimentary beds and as tabular cobbles in streambeds in the southern Ozarks. Future researchers should test their material to insure proper classification.

RESEARCH GOALS

The immediate management goals required by the contract were to do reconnaissance on about 220 acres (89.03 ha), almost equally divided between two lowland areas in the valley (Figure 2), and to test seven previously recorded sites (3CW6, 3CW7, 3CW69, 3CW110, 3CW116, 3CW119, and 3CW127) in order to determine whether these sites represented significant cultural resources potentially eligible for the National Register of Historic Places. Site data was needed on their horizontal and vertical limits, the nature of the cultural remains, and their state of preservation. Access to the sites and the areas to be surveyed had been denied in 1975 by the landowners.

The first three sites (3CW6, 3CW7, and 3CW69) had been recorded during the 1934 investigations of bluff shelters in Crawford County. The notes taken in 1934 were not adequate to plot the sites precisely on United States Geological Survey (USGS) 7½' quadrangles; prior to testing, their locations had to be rediscovered based on written descriptions and two sketch maps of the general locations of the sites. The other four sites were discovered in the 1975 investigations by the AAS. Raab recommended them for testing because they were large bottomland sites having potential to contribute data on a variety of research questions including his proposed seasonal subsistence models.

The research perspectives of the Dellinger and Raab investigations represent two extremely different approaches to archeological study. The goals of the crews sent out by the University of Arkansas Museum in 1934 were to locate dry shelters and recover perishable archeological remains; it was clearly an object orientation. The 1975 research viewed the Lee Creek Valley from a human ecology standpoint. Raab was interested in behavioral reconstruction through the study of the interaction between human groups and their natural environment.

Although both Dellinger and Raab recognized that the occupants of Lee Creek Valley changed through time, they were not themselves interested

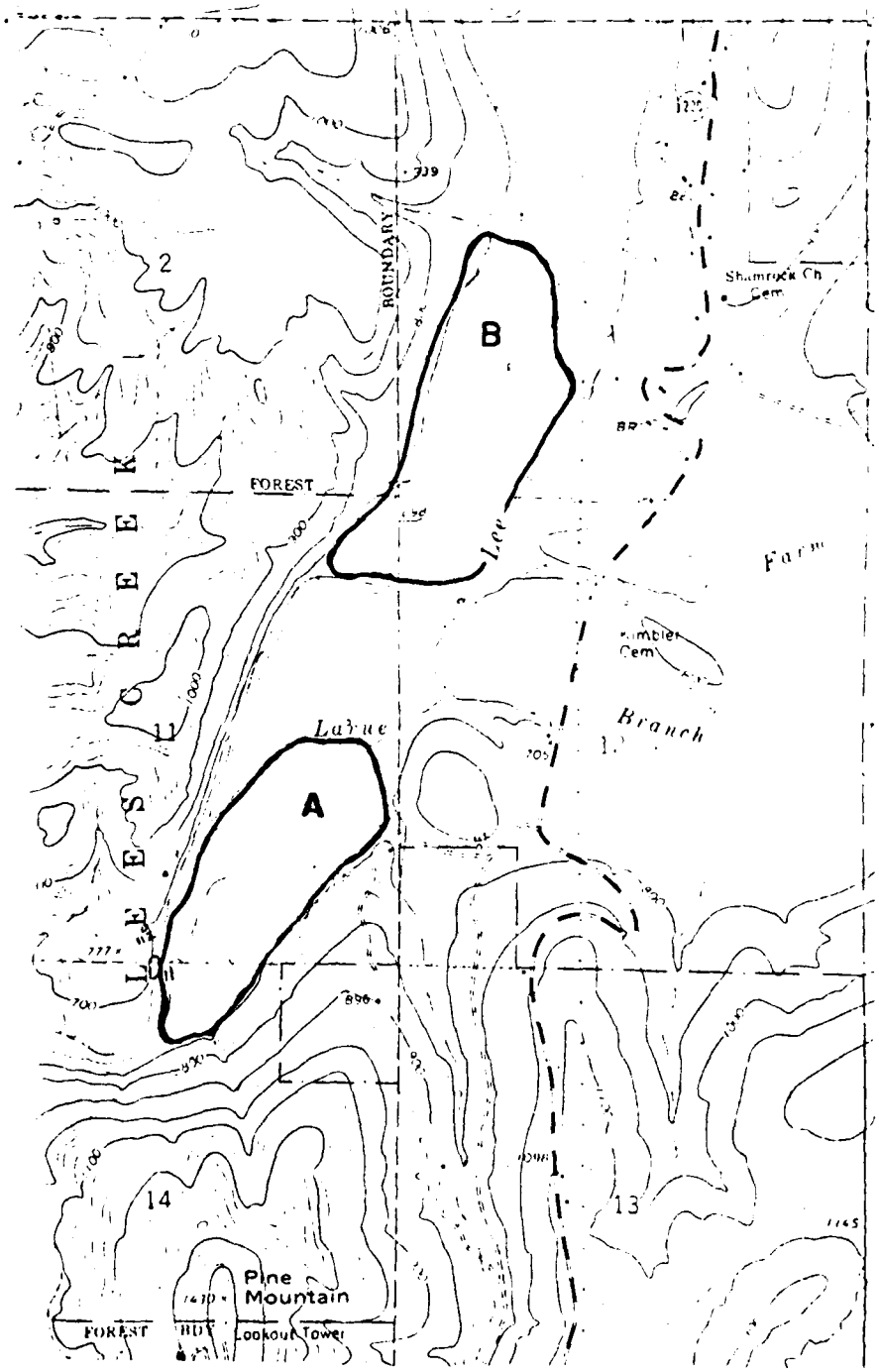


Figure 2. Locations of the lowland survey areas

in delimiting the culture history of the area. Dellinger did not publish site specific reports on his crew's work in the Lee Creek drainage, and Raab (1976) and his assistants only provided indirect clues to the identity of the different inhabitants of the valley in the description of ceramic tempering materials and the illustration of some chipped stone artifacts recovered in 1975.

The presentation of such data has been secondary in much of the research that has been done throughout the Ozark Mountain region, outside of the identification of the "bluff dweller" and later "top layer" cultures by early researchers (Harrington 1924, 1960), and the somewhat more refined classification by more recent investigators of Archaic, Woodland, and Mississippian peoples. The bluff dweller material roughly corresponded with Archaic and Woodland artifacts, while top layer artifacts were of the later Mississippian period (Wolfman 1979:26). For a synthesis of known culture-historical developments in the Arkansas Ozarks, and references to past research, see Wolfman (1979). Although a number of publications, such as Miner (1950), Dickson (1961, 1970), Bartlett (1963), Wood (1963), McCartney (1963), Gregoire (1971), and Medlock (1978), exist, individual site reports and chronology reconstruction have been relatively infrequent compared to the rest of eastern North America, including adjacent Ozark areas in Missouri and Oklahoma.

This has led to some interpretations of the cultural developments in the Ozarks as being retarded compared to those in the Mississippi Valley (Scholtz 1969). Willey and Phillips (1958) thought the entire Ozark bluff dweller cultures represented essentially an Archaic stage of development "despite the abundant remains of domesticated plants in later phases." As pointed out by House (1978), Williams repeated this concept of the Ozark bluff area as "something of a cultural isolate."

> The area maintained its 'hill-billy' stage (sic) with only slight Mississippian influences when it was all but surrounded by the diffusion of traits out to the Plains and in some of the historic Plains Siouan groups and into some of the Caddoan area (Williams 1961).

More recently archeologists have become cognizant of the existence of Mississippian occupations, including ceremonial complexes, in the Ozarks (Wyckoff 1976, Muto 1978, Fritz 1979), and this has called into question the earlier interpretations of the Ozarks as a backwards area where older cultural adaptations persisted.

In order to build upon past research in the Arkansas Ozarks the archeological research goals of the 1979 Pine Mountain investigations (within the structure of the management goals) were:

1. Study and presentation of the data recorded in 1934 was to be done on a site by site basis. This would make most of this information generally available for the first time. In addition to making the information available to archeologists, restudy of the 1934 material was

an important element in the process of evaluating each site for its eligibility for nomination to the National Register. Information from the 1934 work in comparison to the 1975 and 1979 results would provide a much more complete picture of the prehistoric characteristics of the sites as well as their potential to add more information in the future.

2. Data gathered in 1979 were to be applied against Raab's (1976) hypotheses concerning fall-winter deer hunting and spring-summer agricultural subsystems of prehistoric occupation.

3. Study of the distribution of the large siltstone tools and manufacturing debris would be integral to delineation of agricultural practices in the Lee Creek basin. Continued research focused on these tools would build upon previous research and provide additional technological data on their construction and use as well as assisting in the understanding of subsistence practices.

4. Other artifacts, site configuration, and size would also indicate potential site functions, both for application against specific hypotheses such as Raab's, and delineation of general prehistoric settlement systems and lifeways. One component of settlement systems that has often not received sufficient attention in archeological research is the small site with limited artifact remains. Such sites, however, are of value for the definition of short term activities that were integral parts of prehistoric subsistence procurement. To close some of these gaps in the archeological record the 1979 research was structured to pay particular attention to the identification and interpretation of smaller loci of cultural remains.

5. Another gap to be narrowed in the archeological record, and a primary goal of the 1979 research, was the identification of different peoples who might have occupied the Lee Creek basin in the project area, and determination of their distribution there. We hoped to learn what the sequence of rock shelter and lowland habitation might have been through stratigraphic test excavations which could also provide data on the geomorphological history of the basin. The identification of a local sequence would provide a means of studying changing land use patterns over time. Indeed, such data are basic to all of the other research questions which have been posed.

6. The identification of the inhabitants of upper Lee Creek Valley would also tie the basin into broader patterns of cultural trends in the Ozarks and Arkansas River Valley. In turn, this data would be of significance to the delineation of cultural development on both the Great Plains and the Eastern Woodlands. Any Woodland and Mississippian period occupations are of particular interest as they possibly could be part of the settlement system including the Parris Mound further downstream on Lee Creek in Oklahoma and the Cavanaugh Mound on the south side of the Arkansas River near Fort Smith, Arkansas. These sites, in turn, were part of the larger settlement system centered around the Spiro site, one of the most important cultural centers of prehistoric America. Caddoan farmers may potentially have inhabited Lee Creek Valley, contributing foods that supported the ceremonial centers.

Research Procedures

A variety of methods were employed to meet the various management and research goals. Prior to field investigations various notes and records from the 1934 bluff shelters and 1975 Pine Mountain investigations were reviewed. The General Land Office (GLO) maps dated 1833 and 1839 for the project area were examined for identification of potential historic features such as houses, fields, roads, and former drainage patterns. The site files of the Arkansas Archeological Survey were also reviewed.

The reconnaissance and testing strategies were dictated by a combination of budget and time considerations as well as the research goals, and on-the-ground conditions found at the time of the investigations. Approximately five working days for a crew of five persons were available for each of the survey areas and sites to be tested, giving a total of 50 projected crew days. These 50 days were to include support activities (the establishment and closing of a field camp in Lee Creek and transportation of supplies and data from and to Fayetteville). It was important that the project stay on schedule not only to meet report deadlines, but also to finish the field investigations before winter weather set in. Roads into the project area (Routes 59 and 112) cross mountainous terrain and would be impassable under severe snow or ice conditions. Also, Lee Creek had to be forded to reach some areas, and a rise in the creek level would have hindered access.

Several unknown factors about the local sites were cause for concern as to whether the field crew would be able to complete its assigned tasks. There were no good data on the potential depth of cultural deposits on the large lowland sites that were to be tested; deposits over a meter in depth would be difficult to define within the available time. The reliability of the locational data on the rock shelters to be "rediscovered" and then tested was unknown. It was known that each shelter, 3CW6, 3CW7, and 3CW69, consisted of more than a single overhang (at least 13 based on the 1934 field notes); if any of these shelters had turned out to have extensive dry deposits, we would have been hard pressed to gather data on all of the overhangs.

The lowland reconnaissance and site testing were carried out before the shelter investigations. This took advantage of the diminished tree foliage on the shelters as the seasons progressed, leaving them easier to discover and study towards the end of November and into December. Vegetation in the lowland pastures remained at a constant obscuring level throughout the duration of the project.

The field crew for the entire project consisted of the project director, a crew chief, and three field assistants. Thus, the crew numbered five persons, except when administrative business required the attention of the project director (the crew chief was then in charge of the crew) or illness kept a crew member out of the field. On the final day in the field we also had the help of George Sabo, AAS Station Archeologist from Fayetteville, his assistant, Gayle Fritz, and Deborah Sabo during the search for 3CW69.

Reconnaissance

As both of the lowland survey areas were almost totally overgrown in pasture or woods (along drainage meanders), creating very poor surface visibility, some subsurface method of prospecting for archeological sites was required. In the research proposal plowing had been suggested as a means of surveying through the vegetation cover in open fields, as the project director had experimented with its use elsewhere (Trubowitz 1975). However, the pastures were in use at the time of the investigation and we were unable to plow them up. Other large scale techniques, such as using a backhoe, could not be employed for the same reason. Shovel testing was settled upon as the most useful technique available for the project.

Shovel test transects were dug generally in 30 or 50 m paced intervals along the edge of topographic features, such as drainage patterns or terraces within the survey areas (Figure 3 and 4). This balanced our goal of finding small sites against the amount of land to survey in the available time. On one occasion when cultural debris was encountered during the excavation of some 50 m interval transects, additional transects were added between the original transects in an attempt to define any artifact distribution pattern, giving a spacing of 25 m between transects.

Shovel testing within a transect varied according to topographic conditions, but generally was between 10 and 15 m. Extremes of internal spacing were 4 m at the smallest and 50 m at the greatest. Most transects consisted of five shovel tests. Some transects were extended as judged necessary in the field, or were reduced to only two or three tests per transect to cover narrower areas. A total of 170 transects were dug with 820 individual tests in reconnaissance on previously unexplored areas (Table 3). Transects 1 through 65 were done in survey area B with the remainder in area A, except for transects 166 to 169, which were excavated adjacent to area B (area B', Figure 4).

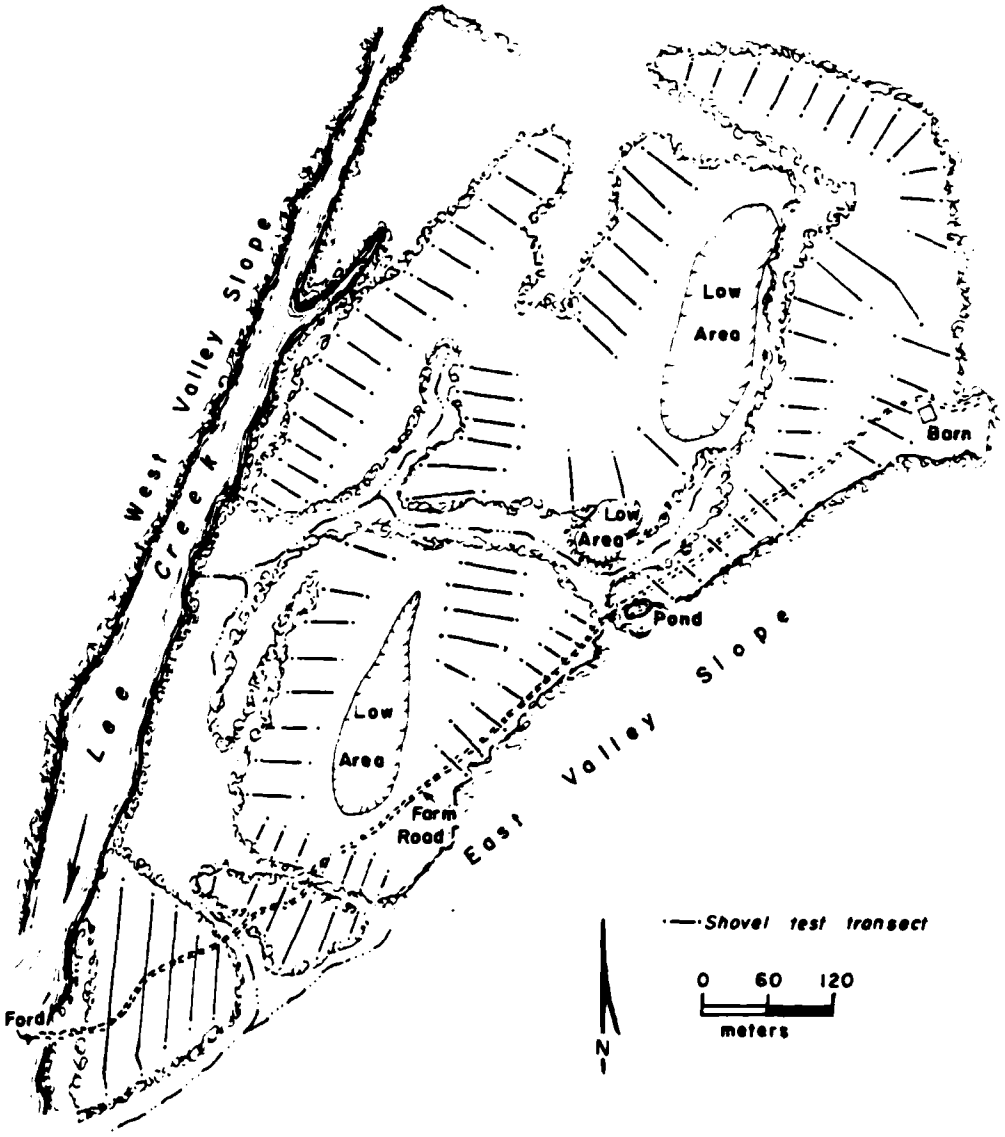


Figure 3. Reconnaissance on lowland area A

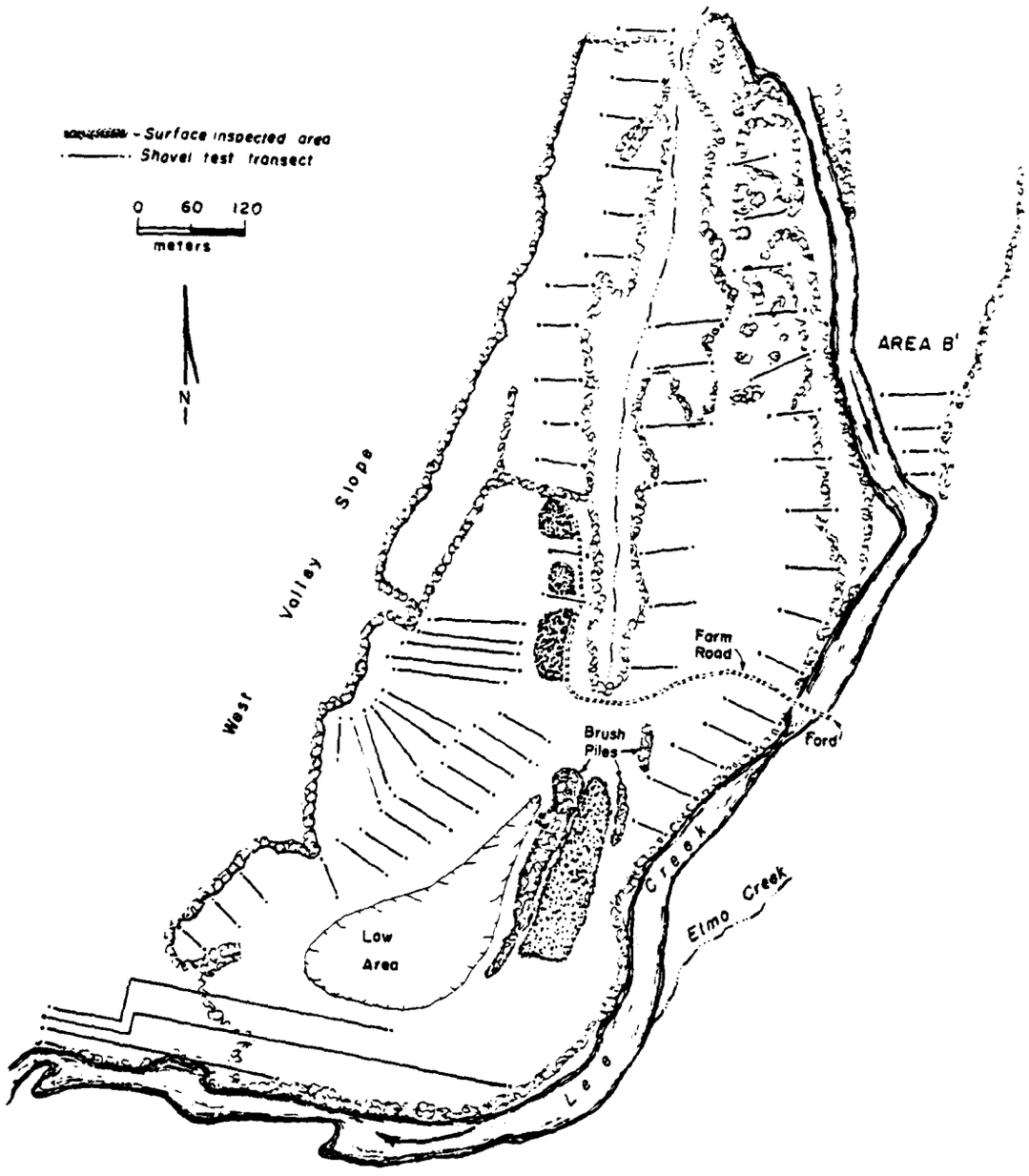


Figure 4. Reconnaissance on lowland area B

Table 3. Summary of reconnaissance shovel test transects

Transect	No. of tests	No. of tests with cultural material	Transect	No. of tests	No. of tests with cultural material	Transect	No. of tests	No. of tests with cultural material	Transect	No. of tests	No. of tests with cultural material
1	1	0	43	5	0	86	5	3	129	5	0
2	12	0	44	5	0	87	5	4	130	5	0
3	21	1*	45	5	0	88	5	3	131	5	0
4	12	0	46	5	0	89	5	0	132	5	0
5	5	0	47	5	0	90	5	2	133	3	0
6	5	2	48	5	0	91	5	0	134	2	0
7	5	1	49	5	0	92	5	0	135	5	0
8	5	1	50	5	0	93	5	0	136	5	0
9	5	1	51	5	0	94	5	0	137	5	0
10	5	4	52	5	0	95	5	0	138	5	0
11	5	3	53	5	0	96	5	0	139	5	0
12	4	4	54	4	0	97	5	1	140	5	0
13	4	4	55	3	0	98	5	1	141	5	0
14	4	4	56	3	0	99	5	0	142	5	0
15	4	2	57	3	0	100	5	0	143	5	0
16	4	2	58	3	0	101	5	0	144	5	0
17	4	0	59	3	1	102	3	0	145	5	0
18	5	1	60	3	0	103	2	0	146	5	0
19	5	4	61	3	0	104	5	0	147	5	0
20	5	0	62	3	0	105	5	0	148	3	0
21	5	0	63	3	0	106	5	0	149	2	0
22	5	0	64	3	0	107	5	0	150	5	0
23	5	0	65	7	0	108	5	1	151	5	0
24	5	0	66	7	0	109	5	1	152	5	1
25	5	0	67	7	0	110	5	1	153	5	0
26	5	1	68	8	0	111	5	3	154	5	0
27	5	2	69	4	0	112	5	0	155	5	0
28	5	2	70	2	0	113	5	0	156	5	0
29	5	3	71	3	0	114	5	1	157	5	0
30	5	2	72	5	0	115	5	2	158	5	0
31	5	0	73	5	3	116	10	7	159	5	1
32	5	0	74	5	1	117	10	6	160	5	3
33	5	0	75	2	0	118	5	0	161	5	1
33.5	1	0	76	5	0	119	5	0	162	5	1
34	5	0	77	5	0	120	5	1	163	5	0
35	5	0	78	5	0	121	3	1	164	5	0
36	5	0	79	5	0	122	2	0	165	5	0
37	5	0	80	5	2	123	2	0	166	2	0
38	5	0	81	5	2	124	3	0	167	3	2
39	5	0	82	5	0	125	2	0	168	5	1
40	5	0	83	5	2	126	3	0	169	5	0
41	5	0	84	5	2	127	5	0			
42	5	0	85	5	3	128	5	0	Total	820	107*

*redeposited material not included in total

The initial shovel tests were [illegible] a depth [illegible] however, [illegible] were expanded and taken down to a depth of [illegible] to [illegible] m. These tests provided a stratigraphic picture of the lowland [illegible] that was [illegible] against a bank profile (Figure 5) in survey area B. These profiles [illegible] various flood deposits overlying river gravels at a depth [illegible] Three small flakes were found in shovel test [illegible] at a depth [illegible] between 70 and 86 cm below the surface, but they appeared to have been water tumbled and were interpreted as being a secondary deposit. Lee Creek has meandered in its floodplain, and the gravel lenses were related to former creek channels. As it was likely that Lee Creek's movements had disturbed much of the deposits 50 cm below the extant surface, and as deep shovel tests did not produce adequate data return compared to the amount of effort and time required to excavate them, we changed our strategy; thereafter we dug down to 30 cm, a depth which generally extended through any shallow plowzone (cultivation of the lowlands had ceased over 20 years before) This was an efficient depth compared to the size of the shovel blades and the pick mattocks that were used to excavate the tests, and the time available for reconnaissance. The diameter of these tests varied generally between 30 and 60 cm. All tests were filled in immediately after completion to preserve the landscape and prevent injury to livestock and game.

Figure 5. Lee Creek bank profile, lowland area B. Stadia rod scale in meters and centimeters.

The pick mattocks were required along the upper terraces on the lowlands where the soil was very hard and often contained rocks. The lower terraces adjacent to the modern course of Lee Creek generally had softer soil that could be cut with a sharpened shovel without the assistance of a pick mattock. Of course, some tests were dug to depths shallower or greater than the 30 cm goal depending on the soil matrix and their contents. The back dirt of the shovel test was trowelled through by hand and the profile was checked for evidence of occupation.

As we began to encounter cultural debris in the shovel tests, our excavation and recording time per shovel test increased, and we again changed our shovel testing strategy to remain on schedule. Since the principal aim of the reconnaissance phase of the research was to identify the presence of cultural occupations, rather than to determine noncontrol site limits, and, as the contents of any single shovel test were not statistically significant, it was decided to terminate our reconnaissance shovel tests as soon as cultural remains were identified in them, whether or not they had reached a depth of 30 cm. Sterile tests were still to be taken down to 30 cm.

Portions of the transects that tested the lower elevations of the reconnaissance areas invariably failed to produce any evidence of cultural occupation. As these areas would be flooded by Lee Creek before any of the terraces or swells on the lowland, it was unlikely that the depressions and swales had been occupied. The lowland slopes at a distance from water (above the terraces) also produced no cultural remains. Based on these findings we dispensed with the shovel testing of such areas after the first four transects in the lowlands and transects 54-63 on the slopes of area B.

Occasionally the crew encountered erosional cuts or farm vehicle paths that exposed the surface adequately for surface inspection without shovel testing, but these areas were restricted. A swell in the floodplain in area B had a surface visibility ranging between 50 and 75%; it was the only relatively large portion of the lowland that was subjected to surface collection alone (Figure 4).

As artifacts were found, either on the surface or in shovel tests, they were temporarily designated with surveyors' flags to assist in marking the site for photographs and in determining site size. Field numbers were assigned to the artifact contents of shovel tests, to small clusters of nondiagnostic debris found on the surface, and to individual surface-collected or excavated artifacts as circumstances warranted. The combination of shovel tests and surface collections provided data on the general horizontal configuration, artifact density, and content of the newly discovered sites, answering both locational management needs and archeological research goals on settlement systems.

Site Testing--Lowland Sites

The field methods used in reconnaissance were also applied to the site testing of the lowland sites, 3CW110 and 3CW119. These sites were overgrown, with the exception of a garden on 3CW110, and shovel tests were used to help define their horizontal limits (Table 4). These two sites also had large portions of their area suited for surface collection without shovel testing, in areas of thin pasture cover, in exposed farm vehicle paths and eroded slopes, and in gardens.

To determine our surface collection strategy we first flagged all the surface finds without collecting observed materials. When the flags showed too great an amount of material for total collection under controlled conditions within the available time (much of it was debitage), a select collection was made of all recognized diagnostic artifacts, tools, and a sample of the flakes and different lithic types observed. The concentration of flags was photographed before they were removed to show the density of debris.

The gardens on 3CW110 and 3CW119 provided opportunities for complete collection of all artifacts on those portions of the sites. These gardens were measured and then divided into four collection units of roughly equal dimensions respective to the size of the garden. All artifacts found on the surface of these units were collected. On 3CW119 the garden required a fresh plowing and rainstorm before the artifact visibility was adequate for this collection strategy (see below). Some smaller loci of archeological remains on 3CW110 were collected as complete units with the photography of surveyor's flags to mark find locations.

In both the select collections and the controlled garden collections the recognized diagnostic artifacts (projectile points, siltstone bifaces and sandstone hammerstones or pitted stones) were individually mapped with a tra-con surveying instrument. The tra-con is a light portable surveying instrument well suited to making maps of small areas and easily transported into rough terrain because its head is carried in a box that can be attached to a waist belt and the tripod collapses into a small case that is slung over one's shoulder. Its only limitation was that its viewing range, which is short compared to transits and theodolites, required setting up several mapping stations on the large lowland sites in order to take readings on all of the major artifact finds and other pertinent features. Besides shooting-in the diagnostic artifacts, the instrument was used to record landforms, landmarks (buildings, trees, fences), and test excavations.

While the surface collections and mapping provided data on horizontal site limits and artifact distribution, test units larger than shovel tests were required to answer questions about the sites' vertical limits, integrity, geomorphology and cultural stratigraphy. The largest test excavation units used on the lowland sites were 1 m^2.

Table 4. Summary of site excavation shovel test transects

Site Number	Transect	Number of Tests	Number of tests with cultural material	% of tests with cultural material
3CW6		10	2	20
3CW7		12	4	25
3CW110	1	2	0	
	2	3	0	
	3	5	0	
	4	5	0	
	5	5	0	
	6	5	0	
	7	5	0	
	8	5	0	
	9	5	0	
	10	5	0	
	11	5	0	
	12	5	0	
	13	5	0	
	14	5	1	
	15	5	1	
	16	3	0	
	17	2	0	
Subtotal		75	2	2.6
3CW119	1	8	1	
	2	7	0	
	3	8	3	
	4	8	3	
	5	5	1	
	6	5	2	
	7	5	1	
	8	5	1	
	9	4	1	
	10	5	0	
Subtotal		60	13	21.7
"Elmore"		3	0	0
Total	27	160	21	13.1

These tests were placed to sample each terrace on 3CW119 and to check several occupation loci on 3CW110. The first test unit (on 3CW119) was dug in 10 cm layers until the end of a natural or cultural zone was encountered. This technique was too time consuming, and, as no cultural features were encountered, the strategy was switched to shovel skimming out entire natural or cultural zones and levels as units. Once an apparently sterile level had been reached, one half of the test unit was selected for deeper excavation and taken down as much as possible, usually about a meter below the surface. The soil below the cultural zones was generally so hard that it could not be dug out with a shovel; a small pick mattock was used and its purchase was restricted in such small quarters. All soil from the test excavations on the lowlands was put through a ¼ inch mesh screen. This was the smallest size mesh through which the soil matrix would pass relatively easily. Profiles were drawn of at least two walls and photographs were also taken of these profiles. Soil samples were taken from each soil zone or level for chemical analyses. The test units were backfilled after all of the record forms had been filled out.

Site Testing--Shelter Sites

The rock shelters posed some difficult obstacles for the testing phase of the research. They first had to be relocated from general descriptions. One site, 3CW69, could have been in one of two places (see below). The general locations of 3CW6 and 3CW7 were known but they still had to be found and correlated with the 1934 notes. Fortunately, these notes, compiled by Wayne Henbest, included floor plans of one overhang at 3CW6, three overhangs at 3CW7, and one shelter at 3CW69. There were also photographs of some of the bluffs at 3CW6 and 3CW7 that we were able to compare with the rock formations present in 1979.

Access to the shelters was feasible only by climbing up the slopes to them. Equipment had to be hauled up and cached while we worked there. Trails were very narrow along the bluff line with hazardous footing. Hard hats and dust masks were worn as protection against falling rocks and dry shelter dust.

After identifying the locations of the shelters, a visual inspection showed that very little cultural occupation was likely to have survived on the narrow ledges. Much more bare rock was exposed in 1979 then showed in the 1934 photographs, and there had been some additional rock falls in the intervening 45 years. Most of the shelter floors had eroded away. As there were 13 known overhangs to check, some stretching for over 100 m in length, and, as we discovered four additional overhangs, our strategy was to shovel test the few remaining areas within the shelters or on the talus slopes in front of them, where some soil still remained between the rock falls. Although we were equipped with small jacks, there was not enough time to move large rock falls to get at potentially undisturbed deposits. If cultural material was encountered the test unit was expanded into a 1 meter square or a 1 x ½ m trench.

The only exception to this testing technique was a 3CW6, Shelter A, which was just above Lee Creek and had been repeatedly flooded, leaving a buildup of sandy silt. A 4 x ½ m trench was excavated in the widest portion of the shelter, since that area had the greatest potential of having been occupied and of retaining cultural remains.

The tests in the shelters were excavated with shovels and trowels and pick mattocks in hard deposits. Excavations continued until either bedrock or immovable rock falls were encountered, or until the test had ceased to encounter cultural evidence. As the soil or dust in the shelter was very fine, and, as we wanted to recover remains as small as possible from the general shelter floors, all of the soil from the shelter test excavations was passed through 1/8 inch mesh screen, with the exception of the test trench in 3CW6 Shelter A, where the flood deposits were just shoveled out once it had been determined that they contained no cultural material. As with the lowland sites, profiles were drawn and photographed, soil samples were collected, and the test units were backfilled. No dry deposits with fragile cultural remains requiring special handling were found in the tests.

Floor plans and profiles were prepared for 11 overhangs, using a variety of measuring methods, including the tra-con, compass bearings, tapes and level lines, and a stadia rod. Photographs were taken of all of the shelters we encountered.

Record Keeping and Data Curation

The regular crew members kept individual daily field notebooks in addition to specialized shovel test, excavation unit, photographic records, field catalogs, and other record keeping forms. Site locations were plotted on an aerial photograph of the project area (along with the general location of reconnaissance shovel test transects) and on USGS 7½' quadrangles. All notes and records will be curated in the Registrar's Office of the AAS headquarters in Fayetteville. Duplicate records and the artifacts and soil samples collected will be maintained by the Fayetteville research station of the AAS.

Analyses

The artifact collections were washed and given a preliminary identification and sort at the field headquarters of the project before they were returned to the laboratory of the AAS at the University of Arkansas in Fayetteville. There the material was catalogued and boxed for eventual permanent storage. The lithic material was identified by Charles Hoffman and other AAS lab personnel through comparison with type specimens maintained by the laboratory. Projectile points were identified by the project director in consultation with Don Dickson (AAS) using sources such as Bell (1958, 1960), Chapman (1975), Marshall (1958) and Perino (1968, 1971).

Ceramics were identified by Phyllis Marie Clancy (AAS laboratory staff) through an examination of the paste, tempering materials, manufacturing techniques, decorative elements, and vessel form. These attributes were compared against sources such as Brown (1971), Phillips (1970), and Dellinger and Dickinson (1942) to determine the ceramic types they were most similar to. Only a summary of the ceramic analysis is included in this report; supporting documentation will be provided in a later report. For definition of ceramic terms used, see the sources cited.

As there were few historic artifacts, they were all identified by Leslie Stewart-Abernathy (AAS, Pine Bluff Station and member of the Arkansas State Review Committee for Historic Preservation). Soil samples were processed at the Soil Testing and Research Laboratory of the Agronomy Department, University of Arkansas, Fayetteville. Beverly Watkins, (AAS Historian) visited the Crawford County Courthouse and the Arkansas State History Commission in search of data to answer historic questions raised in the course of the field research.

Additional analyses not yet undertaken on the 1979 material include study of the lithic debitage for manufacturing stage, wear pattern analyses on the lithic tools, and vessel reconstruction and analysis for bone tempering on the ceramics.

As very little cultural material was found in the shelters in the 1979 investigations, the 1934 collections had to be reexamined to obtain sufficient data for significance determinations and to shed light on the archeological problems. These collections are maintained by the University of Arkansas Museum in Fayetteville. Again the lithics and ceramics were identified by AAS personnel. The faunal remains (with the exception of mollusks and a few bones that were missed in the analysis) had already been identified by Charles Cleland (1965, n.d.), and most of the basketry and cordage had been typed by Sandra Scholtz (1975). Scholtz reexamined the plies in 1980, identifying knot types and some materials that were previously not part of her analysis, including the recognition of a new rim form and a complicated float weave mat/basketry pattern (Appendix 1). Several botanical specimens previously were sent to the Ethnobotanical Laboratory of the University of Michigan for identification as to genus and species. These data were available only in unpublished laboratory reports (Gilmore 1936a, 1936b). Nut remains were examined for this report by Jerry Hilliard (AAS, Fayetteville), but the majority of the botanical remains have not yet been identified.

Research Results

Within the described field constraints and property access permissions that were obtained, all of the management goals were fulfilled through the research procedures that were employed. Once again denial of access prevented the completion of some of the work, but we were able to attain most of the project management goals within the projected work schedule. The two lowland reconnaissance areas were covered as completely as possible and the locations of the three 1934 shelter sites were identified for testing. Shelter sites 3CW6 and 3CW7 were tested, but the most likely location of 3CW69 could not be investigated as the landowner denied access. In the field research four more shelters were found and tested beyond those described in the 1934 notes bringing the total number of overhangs represented on the three sites to 17. Two of the four lowland sites, 3CW110 and 3CW119, were successfully examined, but the other two, 3CW116 and 3CW127, could not be studied as the landowner refused permission. A number of attempts were made both by the Corps personnel and the project director to meet with the landowner, but to no avail.

In the reconnaissance 10 new archeological loci were recorded, and our knowledge of three previously known sites' boundaries and/or contents was expanded (Table 5). The shovel testing was far more successful than could have been expected. One hundred and seven out of the 820 shovel tests (13%) produced artifacts (Table 3). In the transects encountering cultural materials, 49 out of the total 170 transects (28.8%), the average transect test yield was 44.2%. This return rate on shovel tests or transects is the highest the project director has ever found in thousands of tests exploring for new sites; usually only a fraction of a percentage of shovel tests produce artifacts. Shovel testing on the previously known sites also yielded a high return rate of 13.1% (Table 4). This suggests that the sites in the Pine Mountain project area contain a high density of cultural remains from heavy occupation/utilization. Nine out of the 10 new sites were either discovered or better defined through

Table 5. 1979 site reconnaissance summary

Site Number	Method of Research	Type of Collection	Site Location: Survey Area	Landform	Elevation(ft)	Elevation(m)	Site Size (m^2)
3CW117	surface	complete	--	upland saddle	760-770	231.6-234.7	over 300
3CW122	surface	complete	A	third terrace	680-690	207.3-210.3	41,472
	shovel t.	complete					
3CW146	surface	complete	--	hill	738-768	225-234	over 200
	surface	select					
3CW186	shovel t.	complete	B	third terrace	690-700	210.3-213.4	32,000
	surface	complete					
	surface	select					
3CW187	surface	complete	B	second terrace	687-690	209.4-210.3	12,500
3CW188	shovel t.	complete	B	fourth terrace	698-700	212.8-213.4	10,500
3CW189	shovel t.	complete	A	second terrace	670-674	204.2-205.4	17,375
	surface	complete					
3CW190	shovel t.	complete	A	second terrace	670-673	204.2-205.1	1,000
	surface	complete					
3CW191	surface	complete	A	third terrace	670-680	204.2-207.3	under 100
	shovel t.	none					
3CW192	shovel t.	complete	A	second terrace		204.2	under 100
3CW193	shovel t.	complete	A	second terrace	675	205.7	4,500
	surface	complete					
3CW194	shovel t.	complete	B'	first terrace peninsula	690-691	210.3-210.6	800
3CW195	surface	complete	--	first terrace knoll	660	201.2	216

shovel testing. One locus, 3CW188, was found in a heavily overgrown field where we had not expected to encounter a site. While shovel testing by no means guaranteed that we would be able to record all sites present in the reconnaissance areas, it has at least improved our ability to discover and find the limits of sites that had materials in the upper 30 cm of earth.

Two historic loci were also noted in the 1979 research outside of the lowland reconnaissance areas being investigated, but within the flood reservoir of the project. The village of Cove City (Lee Creek) and its cemetery were not investigated in 1979 (as they were outside the scope of work) but they will require further assessment (see below).

Individual sites are discussed below in order by their Arkansas state site number within the subcategories of sites investigated through reconnaissance alone, followed by sites that were test excavated. Individual site classifications (functions) are postulated on the basis of a combination of the available data, including horizontal site configuration and size (area); the amount, density, and kinds of cultural material; and the site location within the local environment. For example, smaller lowland sites of late prehistoric age with possible agricultural tools were postulated to be single family farmsteads, while larger lowland loci of such material were called hamlets or villages. Summaries of cultural history and settlement patterns follow these discussions and should be consulted to place the sites within their local context.

Sites Investigated Through Reconnaissance

3CW117

The 1975 survey described this site as a small scatter of prehistoric lithics in an upland saddle (Hurdelbrink et al. 1976:108-109). In 1979 the field crew examined the condition of the site while waiting for access to another portion of the project area. Historic artifacts as well as additional lithic debris from the prehistoric component were found in the roadbed leading past the site.

The scatter of debris in the road (which was completely collected) indicates that the site is probably over 300 m^2 in size. Its elevation is between 231.6 and 234.7 m above sea level. Soil maps give the local soil type as part of the Nella-Enders association, which forms on steep hillsides (Garner and Cox 1979). While an intermittent tributary to Larue Branch Creek probably provided potable water for the prehistoric occupants of the site, a stone-lined well on the relatively level area above the road (Figure 6) served the Euro-American inhabitants. To the south of the site an abondoned roadbed led towards Van Buren (Figure 7).

Artifacts

The prehistoric debris recovered in 1979 include 26 unmodified flakes, 5 flakes with edge modification (e.g., Plate 1e), and 4 biface fragments (Plate 1a-d). Most of the lithics (23 pieces) are Boone chert. There are also seven pieces of Pitkin chert (including one of the biface fragments), and five siltstone flakes. The 1975 collection included three bifaces (each of a different material: siltstone, Pitkin chert, and Boone chert) and 18 pieces of debitage and shatter of the same materials, mostly Boone. All of these lithic materials are locally obtainable.

Figure 6. 3CW117 stone-lined well

Figure 7. 3CW117 1839 road looking south

The historic debris collected includes 9 glass fragments, 1 piece of a cast iron wood stove, 1 .22 caliber cartridge case, 117 sherds, and 3 animal teeth fragments. The glass includes a clear fragment from a tumbler, a piece of a panel bottle (Plate 1f), and a piece of clear pressed glass (Plate 1g). Except for one window glass fragment the rest of the glass is from vessels. There are eight definite pieces of stoneware, three with a possible alkaline glaze on the exterior (e.g., Plate 1i), and five with Albany slipped interiors and salt-glazed exteriors dating between the 1830s and 1880s (e.g., Plate 1h).

Three pieces of pearlware are decorated with polychrome sponge impressions (e.g., Plate 1n). These artifacts date to the first half of the nineteenth century. There are five fragments of polychrome decorated whiteware (e.g., Plate 1 j-l) using the earth palette, including lime green floral designs, and dating between 1830 and 1860. Another decorative element is on three hand-painted banded rim fragments (e.g., Plate 1m) from hollow vessels, dating to the first third of the nineteenth century. Another sherd with a blue annular decoration dates between the early 1800s and 1900. Two sherds have flow blue decorations, two have hand-painted red decoration, and one whiteware sherd has a polychrome design. Other decoration includes two pieces of yellow ware, one with a white slip on its exterior, and there is one late nineteenth century molded rim. Two shell edged whitewares date between 1850 and the 1880s (Plate 1q-r).

The remaining 85 pieces of undecorated ceramics include both pre-1860 pearlwares, showing a blue puddling in basal fragments of plates (e.g., Plate 1o-p), and whiteware that could date into the twentieth century. Two sherds have makers' marks (Plate 1s-t), which were not firmly identified as they are too fragmentary and were not found in the sources consulted (Kovel and Kovel 1953; MacDonald-Taylor 1962).

Cultural Identification and Settlement Patterns

While none of the prehistoric artifacts yet recovered are diagnostic of any particular culture, the presence of siltstone flakes, possibly the waste from the manufacture of large grubbing or digging tools, suggests that there may have been a Woodland or Mississippian period occupation on 3CW117. The site may have been a small camp where tools were retouched and/or manufactured.

The glass and ceramic assemblage indicated to Leslie Stewart-Abernathy that the main assemblage of historic occupation dates to the pre-Civil War period, probably between 1830 and 1860. The later ceramics might have been associated with the twentieth century trailer occupation.

Beverly Watkins searched for documentary evidence of the nineteenth century occupants of the site, but, as the Crawford County Courthouse records were lost in a fire in 1876, she was unable to locate the landowner by that means. However, the GLO map of 1839 shows the now abandoned road to the south to have been the highway between Van Buren and Fayetteville, making 3CW117 a likely place for a house to have been built. The combined evidence of the map, the well, and the recovered artifacts indicate that a homestead probably stood on the site before the Civil War. It may have been abandoned due to the deprivations caused by the war. Maps dating

between 1857 and 1878 (Crawford County 1857 and Little Rock and Fort Smith Railway 1866-1878) do not show the house, and it could have been destroyed during the war.

Research Potential

With its prehistoric and early nineteenth century components, 3CW117 has the potential to provide data on a variety of research questions. If indeed it contains a Woodland and/or Mississippian period occupation(s), it would provide data on upland resource utilization, a portion of the overall settlement system of late prehistoric peoples that is largely unknown at present. Lithic manufacturing and maintenance could be investigated on the site. The site also contains data on the early Euro-American occupation of western Arkansas and possibly the effects of the Civil War on the population.

Site Recommendations

The serendipitous recovery of more information in 1979 has led to a reevaluation of the status of this site since the 1975 fieldwork. Testing should be undertaken to assess the integrity and limits of the site, following further investigation of documentary sources of information, to determine if the site is eligible for the National Register of Historic Places. The site would be inundated by the construction of Pine Mountain Lake.

3CW122

When this site was first reported (Hurdelbrink et al. 1976:111-112) only two pieces of a Pitkin chert stemmed projectile point (Raab 1976:101, Figure 10e) had been found on the surface of a small rocky knoll. In the 1979 investigations of the upper terrace formation of lowland survey area A we found that the site area extended onto property to which access had previously been denied; the 1979 research refined the limits of the site and increased the artifact sample size for site assessment.

The elevation of the terrace is between ca. 207.3 and 210.3 m above sea level. The soil is a Spadra fine sandy loam. Soil profiles in the shovel tests showed either homogeneous fine grained deposits throughout the excavated 30 $\pm$ cm or a color change from a darker brown upper level to a lighter color soil between 20 and 25 cm below the surface. This was not a well defined plowzone break in the soil profiles. Varying amounts of pebbles were found in these deposits, indicating that colluvial deposition was taking place from the valley side bordering the east side of the site. The west side of the site was the edge of the highest terrace above an intermittent tributary to Larue Branch and Lee Creek. This drainage may have been a past channel of Larue Branch Creek.

Shovel test transects 108 through 122 produced artifacts in 24 out of 80 shovel tests (30.0%) (Figure 8) over an area approximately 288 m long north to south and 144 m wide east to west at its maximum dimensions (4.15 ha or 10.25 acres). Artifacts were also recovered on the surface in an area of light vegetation northwest of transect 117, and on the surface of the farm road running across the site. All of the surface and excavated artifacts were collected.

Artifacts

The 1979 investigations recovered a total of 49 unmodified flakes, 2 flakes with edge modification (e.g., Plate 2d), and 3 biface fragments (Table 6). The lithics were made out of local materials including 34 pieces of Boone chert, 3 Pitkin chert flakes, and 14 siltstone artifacts. All of the bifaces were made out of Boone chert (Plate 2a-c) one of which apparently was heat treated (Plate 2c, identification by Don Dickson).

Cultural Identification and Settlement Patterns

The heat treated biface resembles a Woodland period projectile point, although the missing tip and base make this identification tentative. The presence of siltstone flakes from the manufacture of digging or grubbing tools were possibly indirect evidence of a Woodland and/or Mississippian period occupation(s).

Except for three siltstone flakes found in shovel test (ST) 111.4, the rest of the siltstone was found on the north end of the site in transects 116, 117, and on the surface northwest of transect 117. This part of the site (approximately 110 x 40 m) probably was an area where the large siltstone digging tools were manufactured and/or resharpened. The Pitkin chert was found on the northern, southern, and eastern edges of the site, while the Boone material was found across the entire site. The flaking debris and the heat treated biface are evidence that at least lithic tool processing was done on the site by its prehistoric occupants.

Research Potential

This site can provide additional significant data on lithic manufacturing and tool curation, as well as for other research problems. The site's location on the highest terrace in lowland area A indicates that it may contain the earliest occupations in the immediate vicinity, and was probably occupied longer and more intensively than the sites below it (3CW189, 3CW190, and 3CW193). The high return of cultural material in the shovel tests supports this hypothesis. An understanding of local settlement systems would require an investigation of upper terrace sites such as 3CW122.

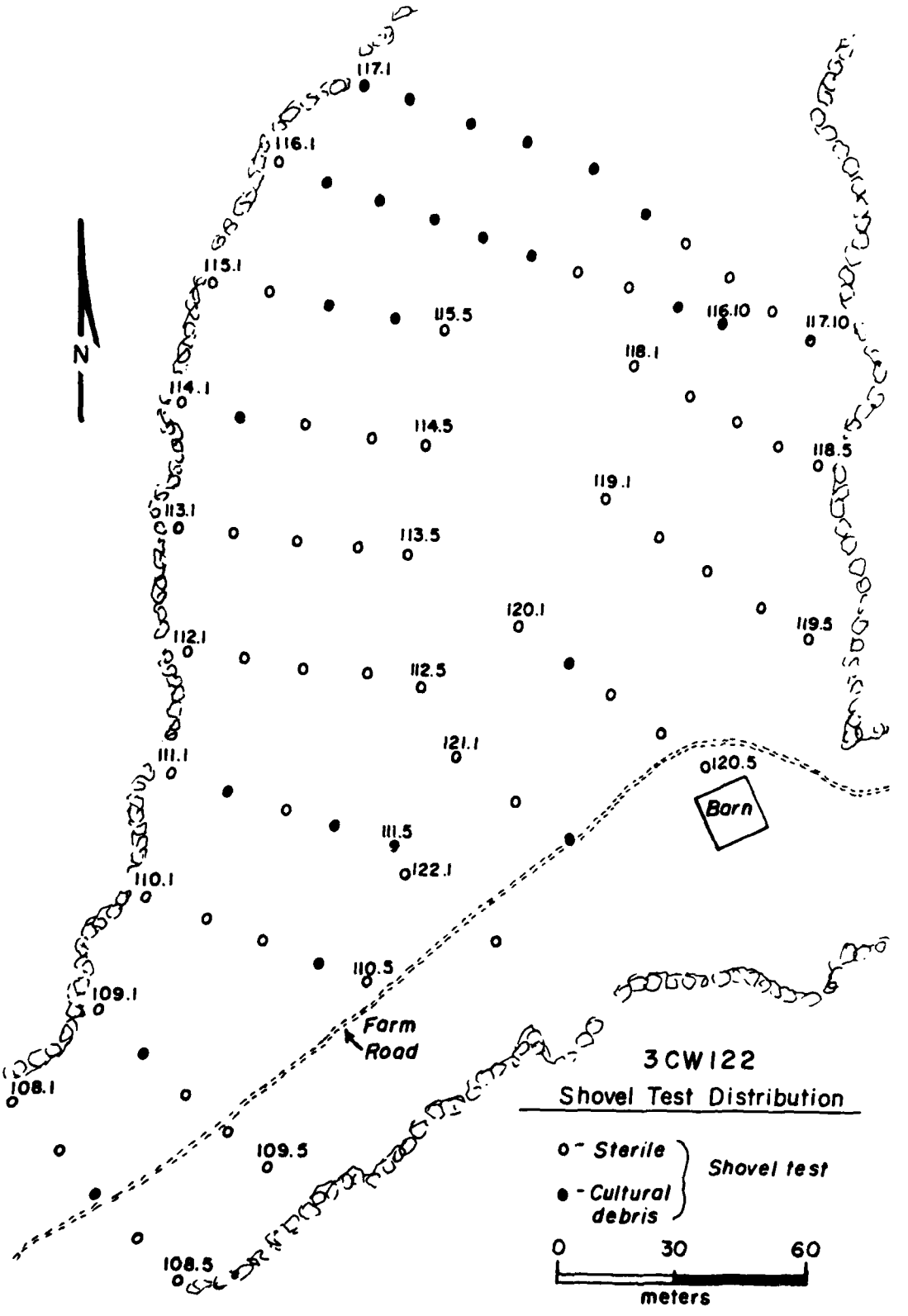


Figure 8. 3CW122 site map

Table 6. 3CW122 artifact provenience summary

Provenience	Flakes						Modified Flakes						Bifaces					
	Chert						Chert						Chert					
	Pitkin	Boone	Penter	Other	Siltstone	Sandstone	Pitkin	Boone	Penter	Other	Siltstone	Sandstone	Pitkin	Boone	Penter	Other	Siltstone	Sandstone
Shovel Test																		
108.3		1																
109.2	1																	
110.4		1																
111.2		2																
111.4					3													
111.5														1				
114.2					3													
115.3														1				
115.4		1																
116.2					1													
116.3		1																
116.4		3																
116.5		3																
116.6					1													
116.9		1																
116.10					1													
117.1	1	2																
117.2		2			1													
117.3		1			1			1										
117.4		1																
117.5					3													
117.6		1																
120.2		1																
121.3								1										
Surface																		
NW of T.17		8			3									1				
dirt road	1																	
Total	3	29			17			2						3				

Site Recommendations

The site would be flooded by construction of the dam on Lee Creek, and it should be tested in order to gather sufficient data to determine whether or not the site is eligible for the National Register of Historic Places.

3CW146

In 1979, while attempting to establish the limits of 3CW119, which lies on the terraces immediately south of the hill where 3CW146 was located, two loci of prehistoric occupations were found on 3CW146. Locus A was on the north side of the fence separating the shed and barn on the Cox property. Four flakes and two biface fragments were found there, with all but the first flake recovery coming from the north slope of the hill, above a cow pond. Locus B was discovered in the dirt road leading up to the Pulford home on top of the hill of 3CW146. A select collection in the roadbed recovered 15 unmodified flakes, 4 flakes with edge modification, and 3 biface fragments. Both loci were probably greater than 100 m^2 in size. Additional field investigations were not carried out in 1979 as this site was outside of the principal area of investigation and was not provided for in our work schedule.

This site was reported by Jurney (1976:19-20) as a cotton gin, located on a knoll overlooking Lee Creek. It may have been the Lee Creek gin that was destroyed by the Lee Creek flood of 1893, which removed all traces except for the engine.

> This gin was located on Lee Creek at the north side of what is known as the Chester Lemon farm today. I was at this gin when a small lad and remember the press was operated by horse power. This gin was never rebuilt, and I believe it was not listed in the gin list of The Heritage last year (Comstock 1958:24).

Additional documentary research would be necessary to confirm that the site is the one described above. Beverly Watkins's inspection of the Crawford County Courthouse and Arkansas State History Commission archives revealed no specific documentation for the site. One of the landowners, Mrs. C. Cox, stated that a sawmill had stood on the property before they bought it. Both operations could have been done there, as combined sawmill/gristmill/cotton gin businesses were present in Lee Creek valley in the late nineteenth century; Mr. J. L. Boyd operated one at the dam on Mountain Fork farther downstream until it was destroyed by the 1893 flood (Comstock 1958:24).

The site is located on Mountainburg gravelly fine sandy loam. The nearest water source is a tributary to Lee Creek on the north side of the site, which was dry at the time of investigation. When filled with water, it would have flowed over the edge of a steep escarpment on the west face of the hill, forming a waterfall. The elevation of the occupations on 3CW146 ranges between 255.6 and 234 m above sea level.

Artifacts

The lithics on Locus A included five pieces of Boone chert and one of Pitkin chert. Both of the bifaces are made of Boone chert (Plate 2e-f). On Locus B there were 10 pieces of Boone chert, 11 pieces of Pitkin chert, and a single fragment of siltstone. Two of the bifaces are made of Boone chert, and one of Pitkin. The four flakes with edge modification include the siltstone piece, two Pitkin chert, and one Boone chert for raw materials. One biface fragment from Locus A resembles the broken base of a late Archaic period Fairland point (Plate 2e). A projectile point fragment found on Locus B is similar to the Archaic period White River corner notched style (Marshall 1958), but part of its base is missing (Plate 2g).

Cultural Identification and Settlement Patterns

The prehistoric occupation may have consisted of two Archaic camp sites, perhaps even separate seasonal visits by the same group of people. These prehistoric components were almost certainly related to some of the occupation on 3CW119. The division between the artifact scatter on the east end of the upper terrace at 3CW119 and the roadbed leading up to the Pulford house on 3CW146 is based upon a small gap in the surface collections. To prevent confusion in site reference the prehistoric occupations on the top and higher sides of the hill were subsumed under the existing site designation of 3CW146.

Research Potential

Although Raab (1976:94) recommended a records check to determine if any pictures could be found of the cotton gin and to determine its significance in terms of industrial growth in the valley, this was not part of the Scope of Work for the 1979 research, as such historic investigations had been reserved for a later phase of the work. This gin was probably a family business that predominately served local crop and lumber needs; the gin/sawmill complex at Natural Dam in 1893 was only 5.8 km (3.6 miles) away. The dates of operation for the gin at 3CW146 have not yet been established, and the two businesses may not have overlapped in their operation. Additional documentary research, a search for informants, and test excavations are needed to place the historic component in its proper historic context and to determine its significance for the National Register of Historic Places.

The newly discovered prehistoric loci on 3CW146 are potentially eligible for the Register on their own merits. Data on small open Archaic campsites and their role within settlement-subsistence systems are almost entirely lacking for the Arkansas Ozarks. Study of these two loci could shed useful information on microenvironmental land use in comparison to the more extensive occupations on 3CW119 (see below).

Site Recommendations

The site would be inundated if the dam is constructed. If the planning of the construction project continues, testing and the noted documentary research would be required to gather the data necessary for making an eligibility determination for the National Register of Historic Places.

3CW186

This site was discovered in 1979 in shovel tests along the large upper terrace in survey area B (Figure 9). The occupation zone stretched for 640 m along the terrace edge overlooking a slough that is probably an abandoned and/or overflow channel of Lee Creek. The existing curving channel of Lee Creek is approximately 250 m to the east and 200 m to the south of the terrace line. While older soil maps (cf. Raab 1976:83) differentiated the soil on the terrace as the Pickwick Series 660, a sandy loam formed on stream terraces from the wash from the uplands, the recent issue of Crawford County soil maps (Garner and Cox 1979), prepared by the U.S. Soil Conservation Service, characterizes all lowland soils in Lee Creek Valley as Spadra fine sandy loam. Elevation above sea level for the site is between 210.3 and 213.4 m.

Figure 9. 3CW186 shovel testing looking southwest along terrace

Shovel testing revealed no discernible stratigraphy in the upper 30 cm of soil on the site. At most a brown humus extended 5 cm below the surface. Most of the soil on the site was very hard, and the shovel tests had to be opened up with pick mattocks, as the shovels were not heavy enough to cut through the earth. Small stones were often found in these tests on the site.

The major evidence of occupation was found in shovel tests on the terrace within 50 m of the bank edge. Most of the site was overgrown with pasture, but some bare areas did provide the opportunity for surface inspection and collection. Thirty-four out of the 70 shovel tests dug on the site produced cultural debris (Figure 10), a very high yield of 48.57%. One shovel test on 3CW186 produced the greatest density of cultural material in any single shovel test of all the sites so tested in 1979; shovel test 8.5 yielded 22 flakes and 3 modified flakes. All material encountered in the shovel tests was collected, and low density areas of surface debris were completely collected. One portion of the site, where the terrace bends to the north, received only a select collection as the crew had already obtained a large sample of flake debris and as the site limits were known to extend well beyond that area.

An area of more intense occupation, as measured in the shovel test results and surface collections, lay between transects 7 and 17, with the most material in transects 10, 12, and 13 (Figure 10). This concentration of debris had a total area of approximately 13,500 m^2; it was 42% of the total site area of 32,000 m^2.

Artifacts

The total artifact collection (210 artifacts) includes 175 unmodified flakes, 22 modified flakes (e.g., Plate 4a), 3 bifaces, 5 pitted stones (e.g., Plate 3a-b), 5 chunks or cores (e.g., Plate 3d-f), and 1 fire-cracked rock (Table 7). One siltstone flake that was accidentally separated from its provenience (79-1495-59) was not included in this analysis. Most of this material was found in the shovel tests, although more of the recognizable tools were found on the surface.

All lithic materials of the recovered artifacts are from local sources. There are 117 pieces of Boone chert, 26 artifacts made of Pitkin chert, 61 pieces of siltstone, and 6 sandstone objects. While all four types of stone were found distributed throughout the site, most of the Pitkin chert was in the area between transects 8 and 13.

Cultural Identification and Settlement Patterns

The primary activity that can be discerned from the artifacts is tool manufacture and/or reprocessing. In the shovel tests unmodified flake debitage made up 91% of the artifacts found. The three bifaces found in the

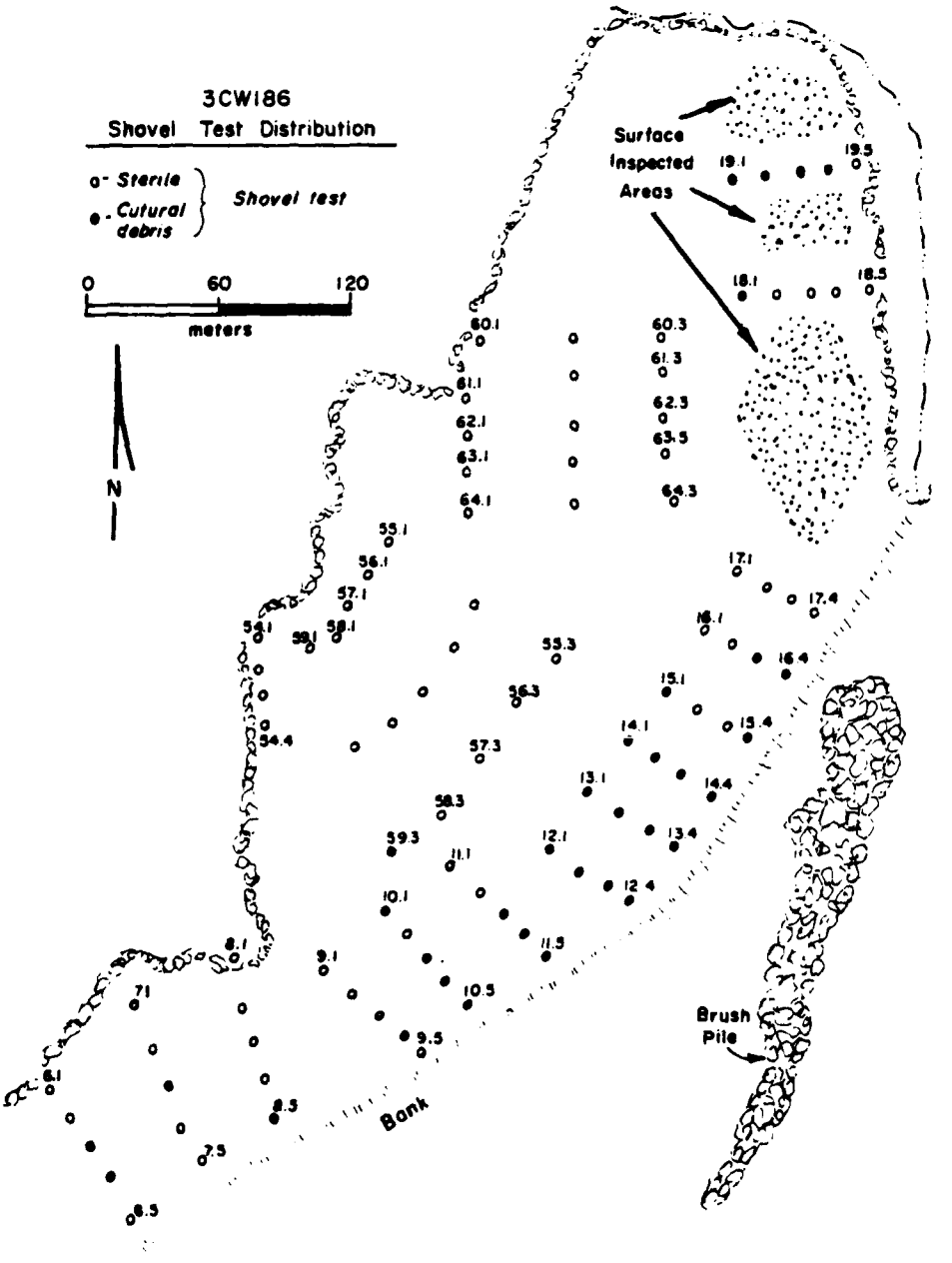


Figure 10. 3CW186 site map

Table 7. 3CW186 artifact provenience summary

Provenience	Flakes						Modified Flakes						Bifaces		Miscellaneous							
	Chert						Chert															
	Pitkin	Boone	Penter	Other	Siltstone	Sandstone	Pitkin	Boone	Penter	Other	Siltstone	Sandstone	Siltstone	Sandstone	Fire-Cracked Rock	Sandstone Pitted Stone	Siltstone Core	Boone Core	Siltstone Chunk	
Shovel Test																						
6.3					1						1											
6.4					1																	
7.3								1														
8.5	1	12			9						3											
9.4					1																	
10.1		2																				
10.3	1	1			1																	
10.4	1	1			2																	
10.5	10	13																				
11.3					1										1							
11.4		4			2			1														
11.5	1																					
12.1	1	1						2														
12.2	2	4			2																	
12.3	1	10			4																	
12.4		6																				
13.1	1	2			2																	
13.2		1			1											1						
13.3											1											
13.4	1	5			4						1											
14.1		1																				
14.2		1																				
14.3					1																	
14.4		1																				
15.1								1														
15.4		1																				
16.3		2			1																	
16.4		1																				
18.1		1																				
19.1		1																				
19.2		1																				
19.3		3																				
19.4					1																	
59.3		1																				
Surface																						
SW of T. 9																						
S of T. 13	1	12			6		2	4			2		1			1	1					
S of slough																						
S of ST17.4		4			3											1						
N of T. 17								1									1		1			
W of N slough								1								1						
E of ST18.5		2														1						
By Station 5		1																				
Between T.19 and T.20	1	4			1						1		1									
N south bank		1			1																	
N ditch	2	5			1								1							1		
Total	24	105			46		2	11			9		3		1	5	2		1	1=10		

surface collection are all siltstone tools. Two of these would be categorized by Hoffman (1977) as spades (e.g., Plate 3g) and one might fit his category of chopper (Plate 3c). Bond (1977) would have classified one of the bifaces found on 3CW186 as the hafting end of a Type I tool (Plate 4B), and the spade as a Type IV tool (Plate 3g). Both types may have been used for digging, possibly for root grubbing and/or cultivation. These tools, when accompanied by Gary projectile points and grog tempered ceramics, are diagnostic of the Gober phase, as defined by Hoffman (1977). Since there were no projectile points or ceramics found in the 1979 investigations, the siltstone tools can only be taken as possibly indicative of Woodland and/or Mississippian period occupation(s), as their use persisted beyond the Gober phase into late prehistory. Pitted sandstone tools may have been multipurpose hammer and anvil tools. Functional uses for the edge modified flakes have not been determined.

A historic component was uncovered during documentary research on survey area B. On the 1839 GLO map a field surrounding a section corner on the southern end of the terrace was illustrated. Although no house was shown on that map, one was illustrated south of the field between it and Lee Creek in the 1870 Crawford County Surveyors' Records, which portrayed the 1839 field in the same location as the earlier map. It is possible that this house was on the original homestead that accompanied the 1839 farming, but the house was not illustrated, as it did not fall on a section line or in the field. In any event, the house in the 1870 records probably did not survive beyond the 1893 flood. No evidence of a historic structure or any historic debris was found during the reconnaissance on 3CW186.

Research Potential

The site was the second largest lowland occupation encountered in the reconnaissance and produced a high yield of prehistoric cultural remains in the shovel tests. It was probably one of the primary lowland occupation areas. The terrace bank may have been occupied as a base camp/village from which gathering or hunting wild resources and/or tending of crops was done on the terrace above their living quarters or on the swell to the south across the old slough (3CW187). The slough would have provided a convenient source of water. Additional research could produce data that would assist in answering a variety of research questions including activities undertaken on the site and its role in subsistence-settlement patterns. The linear nature of the site along the terrace is a clear indication that landform influenced site location, but the specific environmental variables that attracted occupation to the terrace bank have not been delimited. Further data might be sought on the duration of the occupation(s) and the influence of the seasons on local adaptations in Lee Creek Valley.

Although the destruction of the Crawford County Courthouse records would make it difficult to locate early land transections, additional documentary research and interviews with local residents might provide information on land ownership and use in historic times. The early date of the field may mean that its owner was one of the first Euro-American

settlers in the valley. Since the field was not on the main road from Van Buren to Fayetteville, the site could contain information on how pioneer families decided upon the location of their farmsteads.

Site Recommendations

The site would be flooded by the construction of Pine Mountain Lake. Testing would be needed to gather more data for an eligibility determination for the National Register of Historic Places. Testing would be needed on both components and further documentary research on the historic occupation to obtain sufficient data on their extent and content to make this determination.

3CW187

Across a dry slough to the east and south of 3CW186, another prehistoric occupation was identified on a swell isolated in the lowland. At Lee Creek's flood stages this rise may have been a small island of Spadra fine sandy loam, elevation between 209.4 and 210.3 m above sea level. The existing channel of Lee Creek is 50 m to the south and 150 m to the east of the ground swell.

This site was one of the two loci discovered in 1979 that was investigated through surface inspection alone. Surface visibility ranged from 0 to 75%, with the majority of the area 25-50% visible. Although occupation may have covered the entire 12,500 m^2 of the rise (250 m north to south by 50 m east to west), two loci were distinguished, one at either end of the rise. Locus 1 was at the north end of the rise, and Locus 2 was on the lower southern end of the rise (Figure 11). The lower end of the

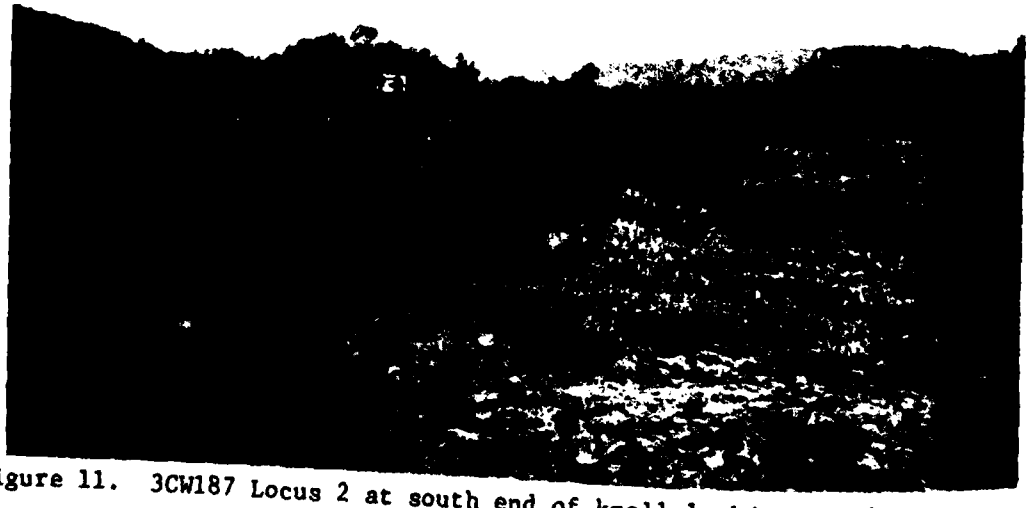


Figure 11. 3CW187 Locus 2 at south end of knoll looking north

rise had large amounts of gravel on the surface, probably from flooding. All of the artifacts found on the site (47 items) were collected.

Artifacts

Locus 1 consisted of a scatter of five unmodified flakes (e.g, Plate 4d) and the siltstone bit (Plate 4c) of a spade (Hoffman 1977) or Type IV tool (Bond 1977). Four of the flakes were made of Boone chert and the fifth of Pitkin chert. This locus was on the west side of the knoll.

Locus 2 spanned the entire width of the knoll, although the debris scatter appeared to be more concentrated on the east and west sides of the locus. The west side of Locus 2 had a scatter of 4 unmodified Pitkin chert flakes, 14 pieces of siltstone debitage, 2 modified siltstone flakes, and 3 unmodified Boone chert flakes (23 artifacts total). The opposite side of the locus produced 11 unmodified Pitkin chert flakes, and 1 modified Boone chert flake (18 artifacts total).

Cultural Identification and Settlement Pattern

Both loci were probably tool retouch areas, with cherts being processed on the east side of Locus 2, both siltstone and chert tools on the west side of Locus 2, and a chert chipping station at Locus 1.

It was hypothesized that 3CW187 may have been a knoll on which crops were cultivated. This speculation is based on the kind, amount, and distribution of materials recovered. The total artifact inventory is small, mostly unmodified flakes that appear to be from tool retouch, rather than from complete artifact manufacturing stages. The Woodland or Mississippian period siltstone biface (Plate 4c) may have been discarded where it was broken. The placement of the two loci at either end of the knoll could indicate locations where the inhabitants sat and watched over crop fields, taking the opportunity to retouch a few tools. Habitation areas may have been on the terrace across the slough bordering the west side of the knoll, where site 3CW186 is located, with its heavier occupation; the high density artifact area on that site is opposite Locus 1 on 3CW187.

Research Potential

If 3CW187 was indeed a prehistoric garden site, it is a cultural resource that can make important contributions to prehistory. Such fields are largely unknown, and study of its environmental characteristics could lead to new insights on horticultural practices. Even if there were no crops grown there, the isolated chipping loci could produce relatively complete artifact assemblages from limited duration single activity areas. Investigation of such isolated behavior patterns would contribute data for a largely unstudied part of prehistoric settlement systems, as well as possibly assisting in the identification of similar activity patterns on

larger, more complex sites. The collection of siltstone flakes could be from the resharpening of a single tool; study of that debris would add technological information.

Site Recommendations

Even though the site had a low artifact density it has the potential to be a significant cultural resource eligible for the National Register of Historic Places. The site would be flooded by dam construction, and testing should be undertaken to gather sufficient data to make an eligibility determination.

3CW188

This site was discovered in the 1979 investigations through shovel tests alone. We had not expected to find a site in this area, since it appeared to be far away from a water source. It is situated on the highest portion on the north and west by a deep ravine. This area was heavily overgrown (Figure 12). Elevation is between 212.8 and 213.4 m above sea level. The closest source of water is in the ravine to the north where a tributary to Lee Creek flows eastward. Lee Creek itself is approximately 100 m northeast of the site at its nearest position.

Figure 12. 3CW188 site area looking north

Cultural material was found in five shovel test transects, with ten out of 25 tests (40%) producing material (Figure 13 and Table 8). The material was distributed across an area at least 210 m north to south by 50 m wide (10,500 m^2). The shovel test profiles revealed no distinct plowzone in the 30 cm investigated. The soil is probably Spadra fine sandy loam, with much of the deposit coming from parent materials washed off of the hill behind it. Only a single level of fine grained soil with many pebbles was found in the tests, below a thin humus layer of a few cm.

Artifacts

Twenty of the artifacts recovered are unmodified flakes; 14 are of Boone chert, 1 Pitkin chert, and 5 siltstone. Six modified flakes were also found, four of Boone and two of Pitkin. The modified flakes were distributed across the site, as were the pieces of Boone chert. The siltstone and Pitkin chert were on the northern 30 m of the site, where the most cultural material was found (Table 8).

Table 8. 3CW188 artifact provenience summary

Provenience	Flakes			Modified Flakes	
	Boone	Pitkin	Siltstone	Boone	Pitkin
Shovel Test					
26.3				1	
27.2	1			1	
27.4	1				
28.4	1				
28.5	2				
29.3	2	1		1	1
29.4	2		2		
29.5	4		3		1
30.1				1	
30.5	1				
Total	14	1	5	4	2 =26

Cultural Identification and Settlement Patterns

Since nearly a third of the artifacts were modified flakes, and the scatter of artifacts was quite broad, the site was hypothesized to have been a camp site of some kind. Chert and siltstone tools were retouched, and the modified flakes were used possibly in processing softer materials. No cultural identification of the former inhabitants can be made at present, although the siltstone could indicate Woodland and/or Mississippian period occupations.

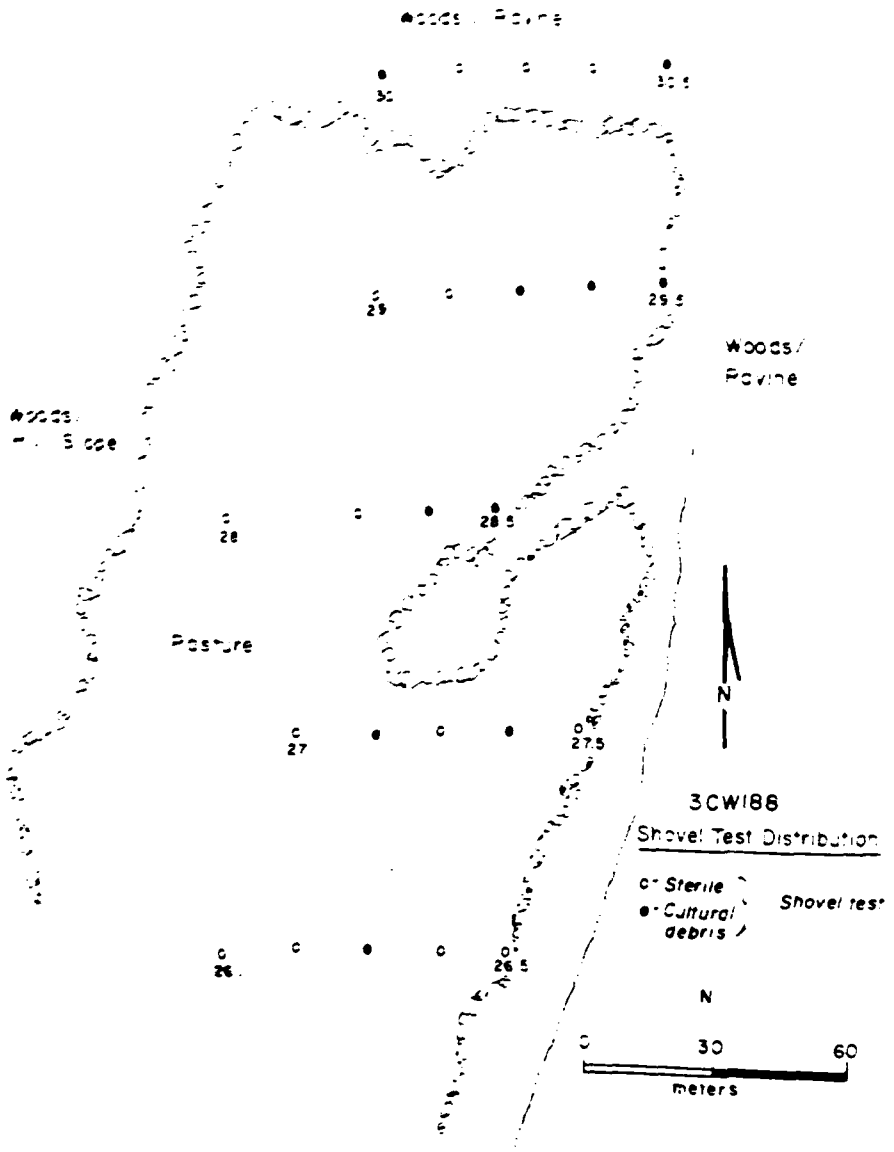


Figure 13. 3CW188 site map

Research Potential

Despite the lack of culture specific information, the site still has potential for containing such data; the shovel tests revealed only a small picture of the site's contents and distribution. The field is reverting to woods, as it has not been cultivated or used for pasture in a long time, and the cultural remains have probably been subject to minimal disturbance. The site's location at the high end of an upper terrace, close to the talus of the valley slope, is the only one of its kind presently known in the valley. The site may be situated in a special microenvironmental area, and could have been the scene of specialized activities. Further research could place the site within the context of local adaptive strategies.

Site Recommendations

The site is potentially eligible for the National Register of Historic Places. If the project is built the site will be inundated, and therefore testing would have to be undertaken to provide enough information for a determination of eligibility.

3CW189

Another site delimited principally by shovel testing in 1979 is 3CW189 on one of the lower terraces (elevation above sea level 204.2 to 205.4 m) in survey area A. The nearest water source is a tributary to Lee Creek at the bottom of a gully 75 m to the west. Lee Creek flows 100 m beyond this tributary. The soil is a Spadra fine sandy loam with few stones in it.

The cultural occupation spanned an area approximately 347.5 m long from southeast to northwest, and 50 m wide from east to west, following the edge of the terrace to the west.

All of the cultural material found on the site was collected (Table 9). Most of the artifacts came out of the shovel tests. Within the 13 transects that fell inside the site area (Figure 14) 27 out of 65 tests produced cultural material (41.5%). The majority of the cultural material was found along the northern 210 m of the site. Sixteen artifacts were found on the surface in the roadbed and vicinity of a farm vehicle path that crossed the southern portion of the site.

Artifacts

The total artifact inventory of 55 objects includes 42 unmodified flakes, 6 modified flakes, 3 bifaces, 3 cobbles and 1 core. Most of the artifacts found (22 pieces) were made of siltstone or Boone chert (22 artifacts) followed by Pitkin chert (11 objects). The modified flakes

Table 9. 3CW189 artifact provenience summary

Provenience	Flakes					Modified Flakes					Bifaces					Miscellaneous				
	Chert					Chert					Chert									
	Pitkin	Boone	Penter	Other	Siltstone	Pitkin	Boone	Penter	Other	Siltstone	Pitkin	Boone	Penter	Other	Siltstone	Pitkin cobble	Boone cobble	Siltstone core	Siltstone cobble	
Shovel Test																				
73.1											1									
73.2	1																			
73.3	1															1				
74.4					1															
80.1		1			1															
80.2																	1			
81.3	1																			
81.5							1													
83.3	1																			
83.5		1			1															
84.4		1																		
84.5	1																			
85.2		1																		
85.3	1	1																		
85.5	1	1			1															
86.3															1					
86.4		2																		
86.5		1																		
87.1					1															
87.2	1				1															
87.4					1															
87.5					1															
88.1	1				1															
88.3					1															
88.4		1								1										
90.1		1																		
90.2					2															
Surface																				
SW of 87.1		1																		
dirt road		5			3		2			2					1			1	1	
12 m E. of rd		1																		
Total	9	18			15		3			4					2	1	1	1	1	55

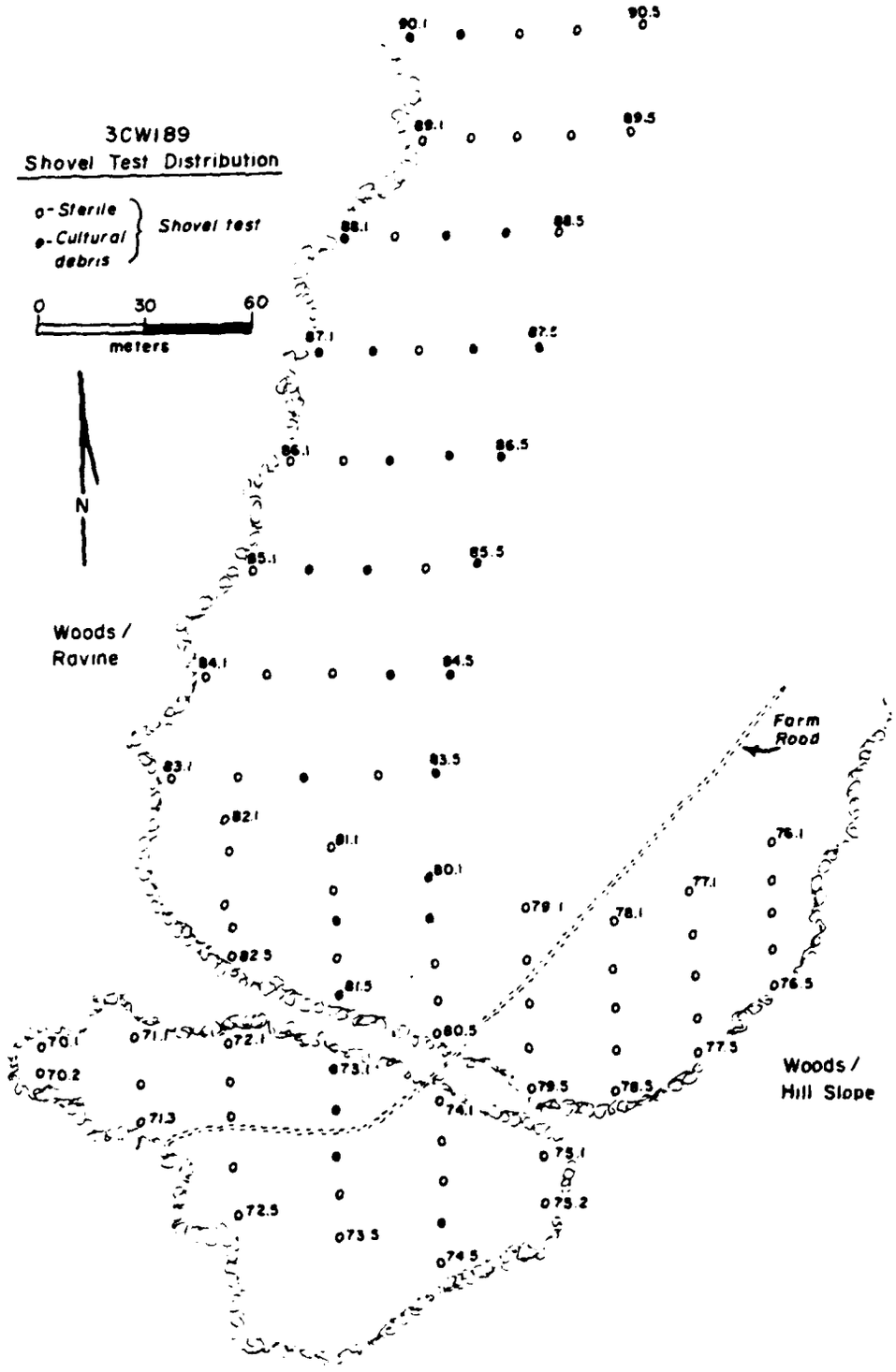


Figure 14. 3CW189 site map

were made of all of the lithic types found on the site except for Pitkin chert (e.g., Plate 5d). Cobbles of Pitkin, Boone, and siltstone were found. The cobble of siltstone was partially worked, but it also still shows the unmodified tabular cobble form found in local streambeds (Plate 5a). The three bifaces recovered include the tip of a Pitkin chert tool (Plate 5e) and two siltstone tools, one of which Hoffman (1977) might have included in his chopper category (Plate 5c) and the other a spade or Bond (1977) Type IV tool used for working soil (Plate 5b).

Avocational archeologists from the Western Arkansas Chapter of the Arkansas Archeological Society had collected in Lee Creek Valley when it was still under cultivation, finding many siltstone tools similar to those found in the AAS investigations of 1979. Over 20 years prior to our investigations, Carl Cleavenger of Fort Smith, Arkansas had designated 3CW189 as "site 49" in his collection records. Since this work was done so long ago, most of the material he found on the site was literally buried at the bottom of his stored collection and was not accessible at the time of our visit to view his data in February 1980. We examined six siltstone tools (Plates 6 and 7) out of his total inventory of 54 artifacts, which he had classified as: "eight large points, six knives, five scrapers, 26 hoes, eight axes, and one celt," all of them whole tools. The six siltstone bifaces that we examined included two of Bond's (1977) Type I tools (Plate 6a-b), one Type II tool (Plate 7c), one Type III tool (Plate 6c), one Type IV tool (Plate 7b), and a large double bitted biface (Plate 7a), a type not included in Bond's study.

Cultural Identification and Settlement Patterns

The siltstone tools probably do not date earlier than the Woodland period, and may extend later into the Mississippian period. As we were unable to study the projectile points that Mr. Cleavenger had collected, and as the 1979 investigations recovered no diagnostic points or pottery, it can only be suggested that the Gober phase from the Arkansas River Valley is represented on 3CW189.

Between Cleavenger's collections and the AAS recovery of both siltstone flakes and tools, it is evident that the use and maintenance of these digging(?) tools was a primary activity on the site. Siltstone was distributed across the entire site. Chert tools were also utilized and reworked on the site. The Pitkin chert materials were found across the entire locus. Boone chert was present across the site except on the south end, Cleavenger's points, knives, and scrapers probably reflect a variety of activities.

The variety of tools found on 3CW189 indicated that it was a living site as well as a tool processing area. Horticultural fields might have been situated behind the encampment to the east. Wild food resources along the creek would have been easily accessible to the west. The number of tools recovered by Cleavenger while the site was under cultivation might imply that such debris might not be expected to still be extant; however, shovel test 86.3 did yield another of the siltstone tools, even though such tests rarely encounter finished tools.

Research Potential

Site 3CW189 still has much data remaining for the investigation of various archeological problems. The manufacture and use of siltstone artifacts could be studied. Comparisons could be made between this site and other terrace loci in the valley. Further research might also provide data on the cultural affiliation and relative date of the occupation of the site.

Site Recommendations

If the Pine Mountain Lake project continues, testing would be needed to provide more information for the determination of the site's eligibility for the National Register of Historic Places, as the site would be flooded by the lake.

3CW190

Across a low slough to the west of 3CW189 another lithic scatter was found in lowland survey area A. This site is much smaller, with cultural material situated within a roughly oval area 50 m long by 20 m wide (1,000 m^2). It is situated on a rise between 204.2 and 205.1 m above sea level, on Spadra fine sandy loam soil. Shovel tests showed a homogeneous soil profile to 30 cm below the surface, with few stones. The slough to the west and south of the site was totally dry. In the past it may have held water, but the nearest source of water at the time of investigation was a tributary to Lee Creek 200 m west and 200 m north of the site. The sharply sloped valley sides rise immediately to the east of the site.

Artifacts

The site yielded only 15 flakes, all of which were unmodified. Although thirteen shovel test transects were excavated to test the east side of the slough, only two transects produced any evidence of occupation. A single Pitkin flake was found in both shovel tests 97.4 and 98.4, which were 30 m apart; however, some additional material was found on the surface of the farm vehicle path that crossed the site, and on the slightly higher part of this terrace east of the road. Nine flakes were found in the road, including seven of Boone chert and two of Pitkin chert. On the knoll east of the road an additional four flakes were collected, including three Boone chert flakes and one of Pitkin chert.

Cultural Identification and Settlement Patterns

As with 3CW187, this site might have been a small activity area where chert tools were sharpened. Both sites were at the end of a swell, both were across a slough from a larger occupation locus, and both consisted of small concentrations rather than linear scatters along the terrace edge. No

cultural affiliation could be assigned to this site other than it having been a prehistoric occupation.

Research Potential and Site Recommendations

It was concluded that this site has additional archeological research value for investigation of settlement patterns and lithic technology as were outlined for 3CW187. It would also be endangered to construction of the reservoir and would require additional testing to determine its eligibility for the National Register of Historic Places.

3CW191

North of 3CW189 and 3CW190, and to the south of 3CW122, two artifacts were found within an area under 100 m^2 in size. A projectile point and a flake were found by a cow pond. This pond had been constructed to take advantage of natural drainage, damming up a small water course. The point and flake may have been brought to the surface by the digging of the pond.

This small area is on the same terrace as 3CW122 but at its narrowest southern end, hard against the valley slope to the east. The elevation of the site falls between the 204 and 207 m contour intervals. The soil is a Spadra fine sandy loam. Several shovel test transects were dug north of the pond where the terrace expanded, but no additional cultural material was found. The soil profiles to 30 cm below the surface were of homogeneous fine grained earth, containing some pebbles.

Artifacts and Cultural Identification

The flake was an unmodified piece of siltstone, a byproduct of tool retouch. The stemmed projectile point (Plate 8a) made of Pitkin chert, appeared to have lost its tip through an impact shatter, implying that it had been lost or discarded while being used for hunting. Don Dickson considered the point to have been a relatively late dart point style, possibly dating to the Mississippian period. The siltstone flake could also date to that period.

Research Potential and Site Recommendations

As the investigation of the site produced only two artifacts, each of which could have been the product of isolated events (the casting of a dart or the striking off of a flake to sharpen a tool), it was concluded that this prehistoric locus did not have much potential beyond what has already been learned from it. The identification of possible Mississippian hunting on the upper lowland terrace by the valley slope is useful information, but in the opinion of the AAS the site is not eligible for the

National Register of Historic Places. Although it would be destroyed by dam construction, no additional research is recommended for this site.

3CW192

This site is on an intermediate terrace 204.2 m above sea level in lowland survey area A. It was discovered in shovel test 152.5 while digging transects set at 50 m intervals. Additional transects were dropped in at 25 m intervals on either side of transect 152 without finding any more evidence of cultural occupation. A total of nine transects (number 150 to 156) with 45 test holes were excavated in an attempt to delimit the site. All but test 152.5 were negative. The shovel tests in the Spadra fine sandy loam showed profiles of soft homogeneous soil to 30 cm below the surface, with an occasional pebble. The single modified flake (Plate 8b) found in shovel test 152.5 was adjacent to a slough that is a tributary drainage to Lee Creek.

Cultural Identification and Research Potential

The site was interpreted as an example of an isolated activity; the flake had served some tool function and then had been discarded. There was no evidence of water washing to indicate that it might have been redeposited by flooding. As an example of a single instance of tool use, and as no cultural affiliation could be assigned to the flake, it was concluded that the site had little potential to produce additional data of scientific value. Due to the success of shovel tests on other parts of the lowland, it was considered that the tests were fairly representative of the amount of cultural material within the depth range of the tests. Although it could not be ruled out that additional cultural material was extant at that location, it was unlikely.

Site Recommendations

The site would be inundated by the construction of Pine Mountain Lake, but no additional research is considered to be needed, as the site does not appear to be eligible for the National Register of Historic Places. It has contributed information on isolated prehistoric tool use on the lowland, but little further information would be gained through more research.

3CW193

The last site discovered in the two lowland survey areas was 3CW193. Shovel test 159.1 produced both a flake and a chunk of Pitkin chert. Additional shovel tests and surface collections along the dirt farm vehicle path that crossed the site area from southwest to northeast further delimited the site (Table 10).

Table 10. 3CW193 artifact provenience summary

Provenience	Flakes			Modified Flakes	Bifaces		Miscellaneous	
	Pitkin	Boone	Siltstone	Pitkin	Pitkin	Siltstone		
Shovel Test								
159.1	1				1		1 Pitkin chunk	
160.1	1							
160.2	1	1	1					
160.5		1						
161.1		2	3					
162.1				1				
Surface Material								
S of T.160	1	3			1			
E of ST.160.2				1				
N of T. 160	2	1						
N of ST.160.1	1							
NE of ST.160.2	1	1						
N of T. 161						1		
Total	8	9	4	2	2	1	1	=27

The site is on the same intermediate terrace level as 3CW192, at an elevation of about 205.7 m above sea level, above a tributary slough to Lee Creek. The soil profile in the shovel tests showed the same homogeneous Spadra fine sandy loam as on other sites in lowland survey area A.

The site extended over an irregular area roughly 90 m north to south and 50 m wide east to west (4,500 m^2). Transects 159 through 162 fell within the site area, and six out of 20 of the shovel tests yielded cultural material (30%). Transect 160 produced three of the tests with artifacts, and gave the widest dispersal information on the site.

Artifacts

A total of 27 artifacts were recovered, with just over half (14) in the shovel tests. Both the shovel tests and surface collections produced similar ranges of lithic materials and artifact types (flakes, modified flakes, and bifaces). The lithic materials included Boone chert (9 artifacts), Pitkin chert (13 pieces), and siltstone (5 artifacts). Nine out of the 21 unmodified flakes were made out of Pitkin chert, as were both of the modified flakes, the single chert chunk, and two out of the three bifaces. The third biface was a siltstone tool similar to Hoffman's spade type, or Bond's type IV soil grubbing tool (Plate 8c).

Cultural Identification and Settlement Patterns

The siltstone tool was evidence of a Woodland or later Mississippian period occupation. The variety of artifacts within so small a collection, the small site size, and the presence of the siltstone tool were the base of suggesting that this site was a small farmstead, perhaps occupied by a single extended family or task group, that raised crops on the surrounding terrace. Some tool retouch was undertaken and other activities were denoted by the modified flakes and bifaces.

Research Potential

This site was the only one found in the survey that might represent a single component farmstead. As such it would be critical for interpreting late prehistoric settlement systems and social organization in the valley. The artifact returns in the shovel tests indicated that additional data were extant below the surface, possibly providing a fairly complete artifact assemblage. This site might be comparable to one found at the mouth of Lee Creek on the Arkansas River at Van Buren, where excavations at 3CW91 (Flenniken and Taylor 1977) produced a floor of a late prehistoric structure that was 6 m^2 in size.

Site Recommendations

The site would be flooded by construction of the Pine Mountain dam. Additional testing to gather data for a National Register of Historic Places eligibility determination will be needed.

3CW194

A report by Martin Cox, son of the landowners, led the crew to test briefly a tip of floodplain directly east across Lee Creek from lowland survey area B, which was just north of 3CW119 and immediately west of 3CW146. This field was heavily overgrown, and four shovel test transects were excavated from south to north. This lowland survey area was called B'. Within this area site 3CW194 was discovered. The site is located on a small peninsula separated from the valley slope to the east by a tributary to Lee Creek that flowed from north to south; the site is just above the junction of the two creeks. This tributary stream was shown in the Crawford County Surveyors' Records in 1870 as a beaver pond. The soil is Spadra fine sandy loam, which is a homogeneous brown fine grained matrix with a few pebbles, as revealed in the shovel tests. The rocks were probably colluvial deposits from the valley slopes. The elevation of the site is between 210.3 and 210.6 m above sea level.

Artifacts

The tests confirmed the reported site location, as two Boone chert flakes were found in both shovel tests 167.2 and 167.3, and three flakes

(one each of Boone chert, Pitkin chert, and siltstone) were found in shovel test 168.4. The shovel test yield was 20% (3 out of 15 tests).

Cultural Identification and Settlement Patterns

No cultural affiliation could be assigned to the site. Since only flakes were found on 3CW194, the only activity that could be directly inferred was the retouch of stone tools. The site may have been a small extractive camp for hunting and/or fishing. It was probably related to the prehistoric loci on 3CW119 and 3CW146. On the steep cliff below 3CW146 and east of 3CW194, a flake of Boone chert was found which could have been discarded by the occupants of either site.

Research Potential and Site Recommendations

Of the sites recorded in 1979, 3CW194 was the only small occupation found directly adjacent to Lee Creek. Definition of the activities at such a site would be valuable in understanding the prehistoric process of subsistence decision making and natural resource exploitation. The tool assemblage at 3CW194 might provide data to help answer such research questions, and it should be evaluated for its eligibility to the National Register of Historic Places. The site should be tested to gather sufficient data to make an eligibility determination.

3CW195

This site was discovered as the crew was searching for the limits of 3CW110 on a low rise west of that site. The elevation of the rise is approximately 201.2 m above sea level, immediately adjacent to an abandoned channel of Lee Creek. The soil type is Spadra fine sandy loam, but the knoll is very stony on the surface. As this knoll is far from the valley sides, it was concluded that the gravel was deposited by the flooding of Lee Creek.

Artifacts

Four unmodified flakes, all of Boone chert, and two modified flakes, also of Boone chert, were found on the surface over an area 9 m wide by 24 m long (216 m^2), in a roughly oval area. The artifacts could have been deposited along with the other rocks on the knoll by natural means, but the relatively small concentration and the fact that the flakes were all made of the same material, led to the conclusion that the artifacts had been deposited there by the people who had made and used them.

Cultural Identification and Settlement Patterns

No cultural affiliation could be assigned to this site. It was probably a small limited activity area where a few flake tools were made and used. The occupants may have been living at 3CW110.

Site Recommendations

This site was well outside the impact area of the Pine Mountain Lake dam, and it is unlikely that it will be affected by the project. No further research in connection with the project is considered to be required.

Cove City and its Cemetery

Another chance find was noted by the field crew in its driving to and from the field each day along the road through Cove City (Lee Creek). On the north side of the community, between two twentieth century residences on the east side of the road, a dark gray marble tombstone was observed sticking out of the weeds. The stone appeared to be one of the shaft styles common during the Victorian period of the late nineteenth century. As this grave site was outside of the work area in 1979 it was not investigated further; we do not know if this is a single family plot or a cemetery for all of the inhabitants of Cove City.

Project Impact and Site Recommendations

Documentary research should be undertaken to determine whether this was an established community cemetery or family plot. The grave(s) would be flooded by the construction of the Pine Mountain dam reservoir, so field inspection should be made to determine the number of graves that would have to be moved.

The historic background and archeological potential of Cove City itself has not been examined. "The unavailability of land grants, homestead abstracts and the confusing variability of some early maps prevented the complete historic resource evaluation of the Lee Creek Valley" (Raab 1976:93). Budget and time considerations only allowed a single day of general examination of Cove City in 1975 (Raab, personal communication). Such historic research was not part of the 1979 scope of work. Besides the cemetery this community still contains occupied residences, some of which date back at least to the turn of the century. There are a church or community center, a post office, and a store still standing, all of them abandoned.

This historic area is on the old road between Van Buren and Fayetteville, which dates back to 1833 on GLO maps. Documentary research, architectural survey, informant interviews, and archeological testing are recommended to identify the research potential and National Register eligibility of Cove City, as it may have been the historic community center for the local valley until relatively recent times.

Lowland Sites Investigated Through Testing

3CW110

Site 3CW110 was located by the 1975 survey; complete collection of the modern garden area was conducted recovering 98 artifacts (Hurdelbrink et al. 1976:103-104). The estimate of site size was roughly 100 m east to west by 50 m north to south. This locus corresponded with the largest of six loci that the 1969 investigations delineated at 3CW110. These are spread along an upper terrace line for about 576 m east to west (Figure 15).

The combined loci give a site area of 10,409.5 m^2, not including the material scattered between the loci. The loci are on the edge of an upper or second terrace above Lee Creek, which gradually fades out to the west. Site elevation is between 204.2 and 207.3 m above sea level. The spacing along the terrace of the different loci appear to be fairly regular, coinciding with tributary drainages in two cases. The largest occupation was on the east side of the site.

Loci

The 1975 garden area was defined in 1979 as part of Locus 1A, which was further subdivided into an overgrown east garden, a west garden, and part of the pasture on the site (Figure 16). Since there was little debris (31 artifacts) in the east garden it was collected as a unit. Part of the west garden, however, showed greater amounts of cultural material, and it was sampled in four equally sized control units each ca. 20 m east to west by ca. 23 m north to south (ca. 460 m^2). Recognizable tools were each plotted with the tra-con and stadia rod within the collection units. This controlled collection strategy clearly revealed that the two eastern units had been more heavily utilized as reflected in the amount of debris collected (as portrayed schematically

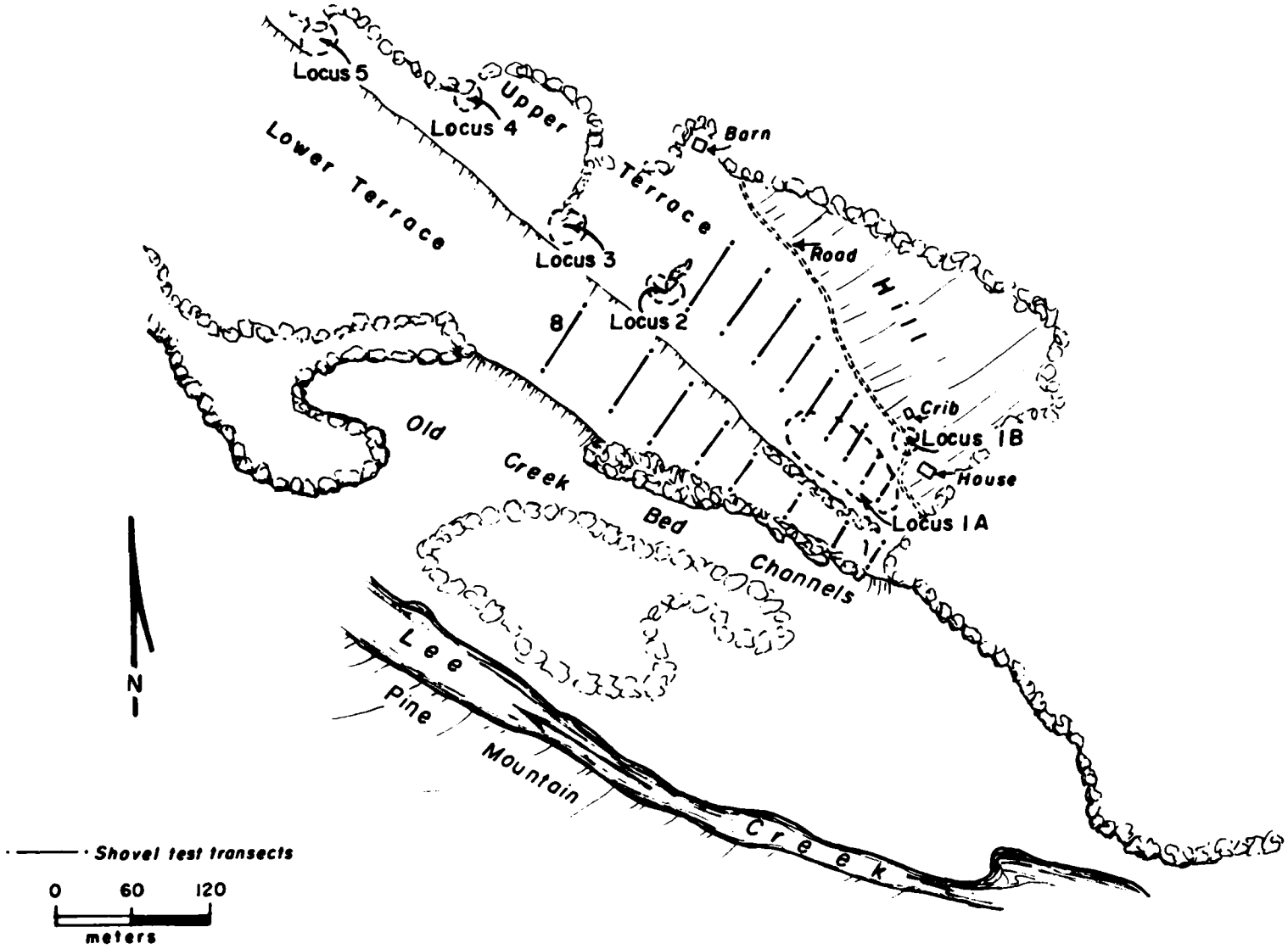


Figure 15. 3CW110 distribution of archeological loci

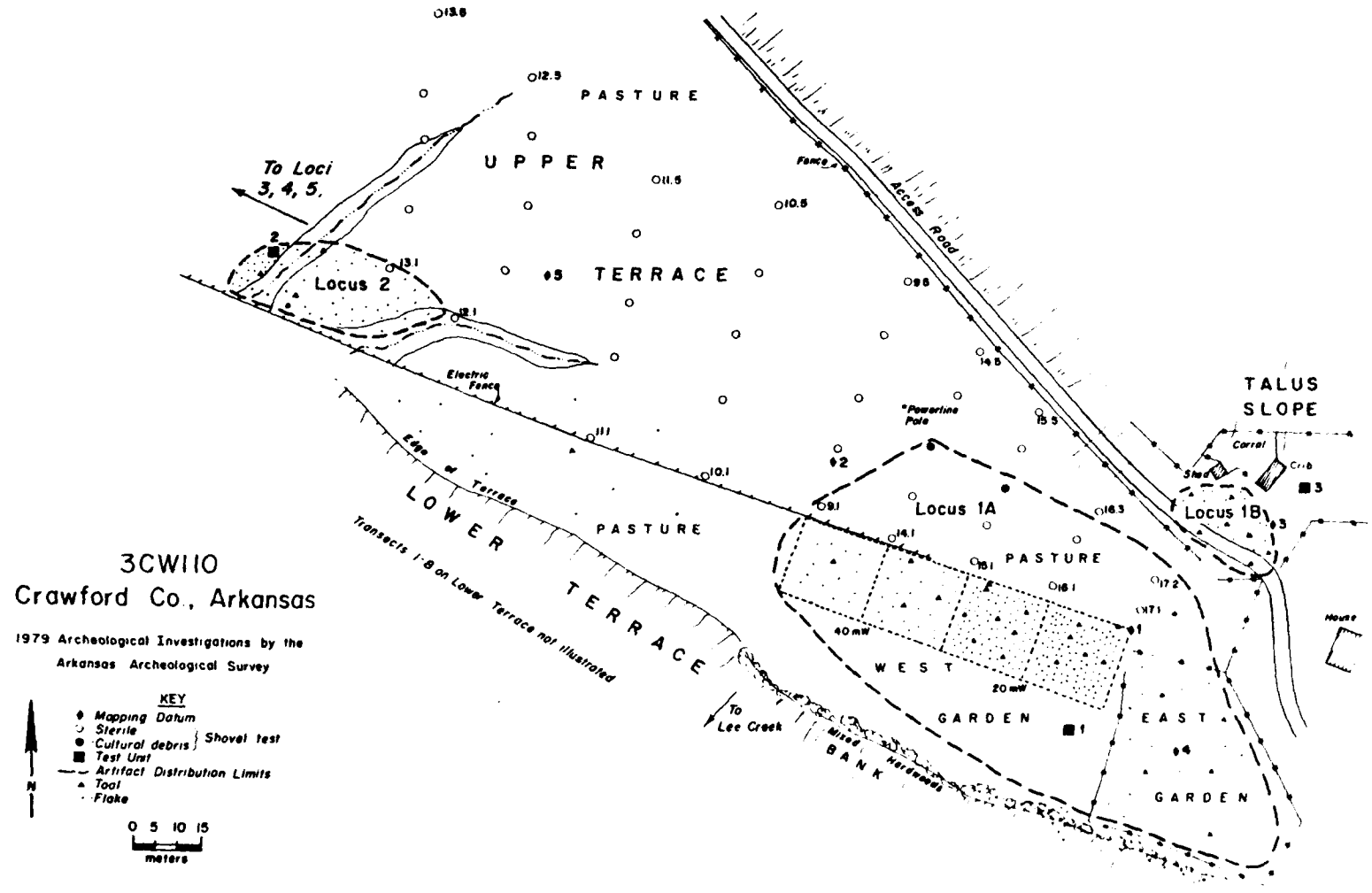


Figure 16. 3CW110 map of artifact recovery and test excavation on Loci 1A, 1B, and 2

in Figure 16). These two units were in the central portion of the locus. The collection unit 0-20 m west contained 95 artifacts, the collection unit 20-40 m west had 92 artifacts, collection unit 40-60 m west had 27 artifacts, and collection unit 60-80 m west had 15 artifacts (Table 11). A biface was found north of the west garden on the slope, flakes were found eroding out of the bank on the south side of the locus, two shovel tests produced cultural material, and test unit 1 also yielded cultural material (see below). The total dimensions of Locus 1A were 126 m roughly southeast to northwest and 57 m north to south (7,182 m^2).

Just to the north of Locus 1A, another concentration of artifacts was found on the surface of the hillside and in the farm access road; this area was designated Locus 1B. Its total dimensions were approximately 27.5 m southeast to northwest and 15 m north to south (412.5 m^2). All of the observed 26 artifacts were collected as a unit. Test unit 3 was excavated near Locus 1B (see below).

West of Locus 1A, between 125 and 145 m away, Locus 2 was defined. It was 50 m long from east to west, and 19 m wide north to south (950 m^2). The west side of the site was cut through by a small tributary stream that may have been deepened into a ditch by the farmer. Complete collections were made on the east and west sides of the ditch, yielding 36 and 23 artifacts respectively (Table 11). Test unit 2 was put in the west side of the locus (see below).

A ditched tributary drainage to Lee Creek cut through another scatter of surface material between 110 and 115 m west of the ditch of Locus 2. Locus 3 was roughly 16 m east to west by 59 m north to south (944 m^2). Again artifacts were completely collected on either side of the drainage, yielding 22 artifacts on the east side of the ditch and 23 artifacts on the west side (Table 11).

Locus 4 was 95 m west of Locus 3. It consisted of two single artifacts. Locus 5 was another 95 m to the west. Five flakes were found within an area 40 m east to west by 23 m north to south (920 m^2). Between Locus 1A and Locus 2 a small scatter of surface material, consisting of 11 artifacts, was found. A scatter of eight artifacts was found between Loci 2 and 3. No artifacts were found between Locus 3 and Locus 4, or between Locus 4 and Locus 5.

Stratigraphy

Shovel test transects were dug on both the upper and lower terraces to help define the limits of Locus 1A and Locus 2. The first eight transects were placed on the lower terrace from east to west, but none of the 35 shovel tests dug along 350 m of the lower terrace produced any evidence of cultural material (Table 4). Transects 9 through 17 were placed on the upper terrace, but only shovel tests 14.3 and 15.3 in Locus 1A produced cultural material (Table 11), for a total site

Table 11. 3CW110 artifact provenience summary

Provenience	Flakes Chert				Siltstone	Modified Flakes Chert				Siltstone	Bifaces Chert				Siltstone	Miscellaneous						
	Pitkin	Boone	Penter	Other		Pitkin	Boone	Penter	Other		Pitkin	Boone	Penter	Other		Boone Chunk	Sandstone	Pitted Stone	Siltstone Chunks	Pitkin Biface	Boone Biface	
Locus 1A																						
Shovel Test																						
14.3	1																					
15.3	1										1	1										
Test Unit 1 (W Garden)																						
surface	1	7			2																	
zone 1	57	159			47	1	4			1		3										
zone 2	5																					
Surface																						
E Garden	10	13			1		1				3	5			1	1						
W Garden																						
0-20 m W	22	51		1	12		1			1		1			3			1	2			
20-40 m W	10	34		1	36		1				2	6			1				1			
40-60 m W	4	8			12							1			1							
60-80 m W	3	4			6							1							1	1		
NE of W Garden												1										
S of W Garden		2			3							1										
Locus 1B																						
Surface		16			2		1				1	5			1							
Between Locus 1A and Locus 2																						
Surface		7			3							1										
Locus 2																						
E of ditch	4	14			15						1	1			1							
W of ditch	4	7			7	1				3		1										
Test Unit 2 (W of ditch)																						
zone 1	10	3			1																	
zone 2	1																					
Between Locus 2 and Locus 3																						
surface		4			4																	
Locus 3																						
E of ditch	1	12			6	2									1							
W of ditch	1	2			3		1					5			1							
Locus 4																						
surface		1																				
Locus 5																						
surface	1	3			1																1	
Total	136	347		2	161	4	9			5	8	33			10	1	1		4	1	1	= 723

return rate of only 2.6%. Surface collections on this site provided better horizontal site distribution data than the shovel tests.

The soil type is Spadra fine sandy loam. Shovel tests on the lower terrace showed a homogeneous soil profile to 30 cm below the surface with varying amounts of pebbles, more coming in tests on the small natural levees on the south (creekside) edge of the lower terrace. Upper terrace shovel tests generally revealed a two zone profile. The upper zone varied between depths of 15 and 25 cm below the surface. This soil zone was a darker gray or brown color than the second zone below it; it may correspond with a plowzone. Test unit 1 (Locus 1A) was taken down to a maximum depth of 76 cm below the surface, revealing a three zone soil profile (Figure 17).

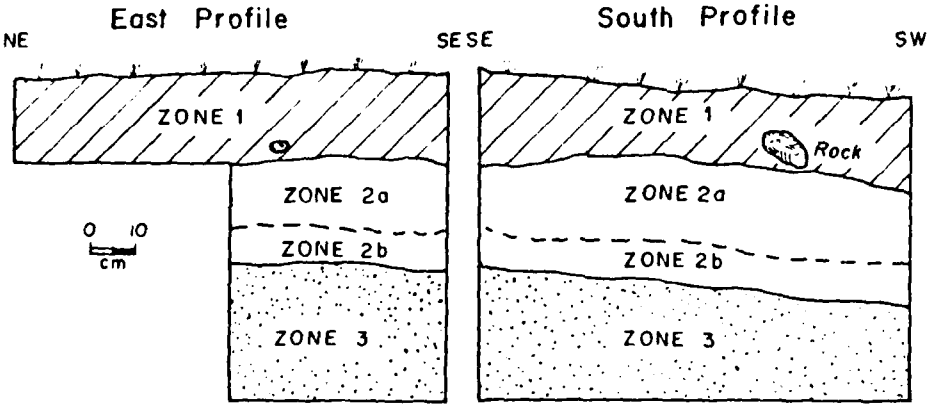


Figure 17. 3CW110 test unit 1 profiles

Zone 1 was 22 cm deep at its maximum below the surface. Except for a few flakes in zone 2 (which were interpreted as being intrusive from above), all of the cultural material was in this upper zone, a homogeneous soil of a strong brown Munsell soil color (7.5YR 5/6). The test unit contained 94 pebbles and stones ranging in size from 2 cm to 10-13 cm across. Zone 2 extended below this zone to a maximum depth of 48 cm below the surface. Except in the first few centimeters this level contained no stones. The upper two-thirds of this zone was separated

out from the lower portion as levels a and b, with the difference between the two being their color, reddish brown in zone 2a (2.5YR 4/4) and strong brown in zone 2b (7.5YR 5/8). Zone 3 continued beyond the base of the excavation. It was a very hard clay-like soil that had to be removed with a pick. Its matrix was a yellowish brown color (10YR 5/8), mottled with very pale brown soil (10YR 7/4). Zone 1 resembled a plowzone level, and the landowner informed the crew that he still plowed this garden area with a horse or mule drawn plow, just to keep his hand in that skill. The other two zones appeared to be sterile gradations of an undisturbed soil profile.

Test unit 2 (Locus 2) was also placed on the upper terrace. It was only excavated to a depth of 38 cm maximum below the surface, showing two zones, similar to the upper two found in test unit 1 (Figure 18). Zone 1 in this unit was also a strong brown color (7.5YR 5/6), but its maximum depth was only 19 cm below the surface, as the unit was on a slope. Only five stones were found in zone 1. With the exception of a single flake (which was again interpreted as intrusive) in zone 2, all of the artifacts were found in zone 1. The soil color of zone 2 in test unit 2 was a yellowish red (5YR 4/8), that was devoid of pebbles.

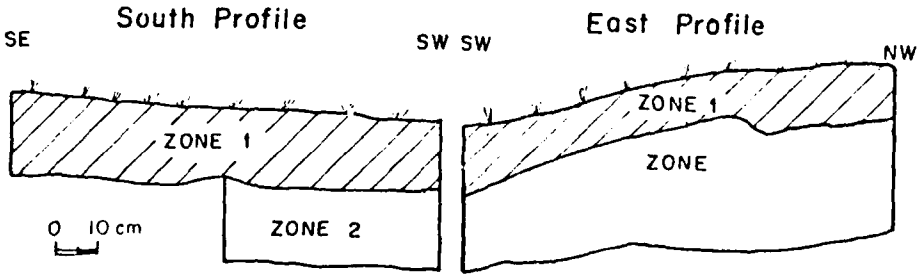


Figure 18. 3CW110 test unit 2 profiles

A third test unit was placed on the slope above the terraces to check for occupation evidence and to reveal the soil profile there. The soil profile showed a very thin humus (zone 1), maximum depth of 4 cm below the surface, overlying a second zone of red clay and gravel

(Figure 19). Neither zone produced cultural material. Zone 1 was dark brown in color (7.5YR 3/2) and the red subsoil was Munsell soil color 2.5YR 4/6. Zone 1 only produced five stones but zone 2 contained 100 rocks (unmodified). The soil on the slope fit the "stony" description of the Nella-Enders association.

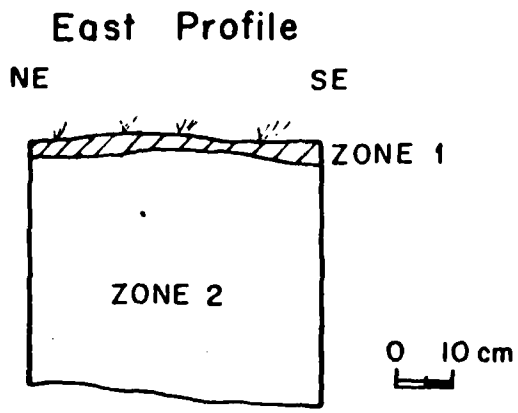


Figure 19. 3CW110 test unit 3 profile

Soil samples from test units 1, 2, and 3 were processed at the Soil Testing and Research Laboratory of the University of Arkansas. All soils were in the acid pH range, from 5.1 to 5.7. Organic materials made up only between .1 and .5% of the soil content. (The high acidity probably accounts in part for the lack of faunal or vegetable remains in the test units.) Amounts of phosphorous, potassium, calcium, sodium, and magnesium were also low (Table 12), though test unit 3 had higher

Table 12. 3CW110 soil sample analysis

Provenience	pH	Organic %O.M	Parts per million P	K	Ca	Na	Mg	Conductivity ECx10^6
Test unit 1								
zone 1	5.7	0.2	5.5	50	225	50.0	50.0	36
zone 2	5.4	0.2	7.0	35	450	42.5	130.0	25
zone 3	5.1	0.1	4.0	40	225	35.0	140.0	25
Test unit 2								
zone 1	5.7	0.5	4.0	30	300	35.0	50.0	26
zone 2	5.7	0.2	4.5	30	275	67.5	77.5	20
Test unit 3								
zone 2	5.7	0.2	80.0	123	300	65.0	180.5	60

amounts of phosphorous, potassium and magnesium, and a higher level of conductivity, reflecting its different parent material composition on the slope.

No evidence of cultural stratigraphic separation was found in any of the test excavations.

Artifacts

All of the cultural debris found in 1979 (totalling 723 objects) were lithics. With the exception of Locus 4, where only two artifacts were found, all other loci produced three basic raw materials that were used for the artifacts: Boone chert, Pitkin chert, and siltstone. Two pieces of chert from Locus 1A could not be assigned to a chert type in the analysis (Table 11).

The majority of the 1975 and 1979 collections were flakes or debris from tool manufacture and retouch (646 in 1979 and 85 in 1975). Large chunks or cores of chert were also recovered (five in 1979 and three in 1975). Utilized or modified flakes were relatively rare (18 in 1979 and 1 in 1975). Bifacial tools totaled 46 specimens in the 1979 collections (e.g., Plate 9b, e-f) and 6 in the 1975 collections. Two uniface tools, which were utilized for scraping were found in 1979. One sandstone hammerstone (Plate 9a) was in the 1979 collections, and three sandstone tools, listed as a ground stone, hammerstone, and an anvil stone (Hurdelbrink et al. 1976:103-104) were collected in 1975.

Flaked bifacial tools were the most common worked implement although they were only a small percentage of the total collections, including the controlled samples such as in the west garden (5.6%) and in test unit 1 (1.1%), both in Locus 1A.

It was noted that the 1975 and 1979 surface collections may have been biased by the past collection of recognizable tools by the landowner and his family. Informants from the Franklin family indicated that they had made large collections (filling a 5-gallon bucket) of projectile points and siltstone tools from their garden. However, this bucket had been stolen, and they only had one artifact in their possession which had been found since then (see below). The Franklin children had hafted some of the projectile points they found and fired them from homemade bows, so the distribution of that class of artifact might be particularly suspect on the surface.

Cultural Identification and Distribution

Variation in the horizontal distribution of the biface tools defined some spatially distinct components on the different loci. At Locus 1A there were at least two components. One was represented by a late Archaic expanding stemmed projectile point found in shovel test 15.3 on

the north side of that locus (Plate 9g). In the controlled collections in the west garden the base of a late style of Gary projectile point (Plate 9c) was found in collection unit 20-40 m west. This fragment resembled the Gary points typical of the Gober phase in the Arkansas River Valley, with a relatively narrow blade, well marked shoulders, and a narrow pointed stem (Hoffman 1977:37). Similar artifacts were illustrated by Hoffman (1977) for the Twin Bridges site (3CW17), Gasfield site (3FR9), and Spinach Patch site (3FR1). The haft end of a Bond Type I siltstone digging tools, also typical of the Gober phase, was found in the west garden in collection unit 40-60 m west (Plate 9d). The landowner also had a Type I siltstone tool in his possession which he had found in the garden area. Other evidence for a Woodland period occupation came from the slope northeast of the west garden in Locus 1 where a fragment of a point base was found that may have been from a Gary style point (Plate 9h).

Locus 1B produced several projectile point fragments similar to Gary projectile points (e.g., Plate 10d,f). Two bifaces appear to have been impact shattered, causing the loss of their tips (Plate 10e-f). Locus 2 produced evidence of two components, separated on either side of the ditch. A possible Gary or Langtry style point fragment (Plate 10i) was found on the east side of the ditch. These points have been placed between 2000 B.C. and A.D. 800 in their time span of use (Bell 1958:28, 38). On the west side of the ditch at Locus 2 the base of a late Archaic period Fairland projectile point was recovered (Plate 10j).

Locus 3 contained mixed evidence of two components on the west side of the ditch that divided it. A late Archaic period stemmed projectile point (Plate 11d), the base of a corner notched/stemmed point similar to Woodland period styles (Plate 11e), and a Maud arrowpoint (dating between A.D. 1200 and 1500 in the Caddoan region of northeast Oklahoma)(Bell 1958:48) were found within that portion of the locus (Plate 11f). A Bond Type IV siltstone tool fragment was found on the west (Plate 11b) and a Type I fragment was found on the east side of Locus 3 (Plate 11a), indicating Woodland and/or Mississippian period occupations

Thus, bifacial tool evidence of aboriginal occupation spanned from the late Archaic through the Mississippian periods at 3CW110. Based on the data collected to date, Archaic peoples occupied Loci 1A, 2, and 3; Woodland period inhabitants utilized Loci 1A, 1B, 2, and 3; Mississippian period occupants were at Locus 3. If siltstone debitage can be taken as an indicator of the manufacture of the bifacial tools typical of the Gober phase and later occupations, there was evidence of such inhabitation on all the loci except Locus 4. The other lithic debitage cannot be assigned to any specific component at present.

Historic Euro-American settlement at 3CW110 has been documented back to 1839. On the GLO map of that year a field was shown in approximately the location of the gardens on Locus 1A. Additional documentary research has not been undertaken on this component.

No evidence of pretwentieth century Euro-American occupation was found in the field research. The structures extant on the site at the time of the investigation included the residence of the landowner, a log crib, a shed, and a barn all dating since the turn of the century. The house had been moved from its original location on the hill above Locus 1A to its present site in the early 1900s (Figure 20). The log crib (Figure 21) was built in 1910 (Floyd Franklin, personal communication). All of the buildings were still in service.

Figure 20. 3CW110 farmhouse looking north

Settlement Patterns

The use of 3CW110 has varied over time with the different occupants. The Archaic components most likely represented small hunting and gathering stations, where some tool retouch might have been undertaken in conjunction with food procurement activities. Test unit 2 was placed to investigate the Archaic component on the west side of Locus 2. The low return of only 15 artifacts in the entire unit showed a low intensity of occupation there, as compared to the 281 artifacts that came out of test unit 1 on Locus 1A. (Siltstone flakes in both units may be evidence for Woodland occupations.) The similar sizes of Loci 2, 3, and 4, in conjunction with the tributary drainages running through the two former loci, may indicate similar functions for all of these loci through time. These small loci may have been occupied at different times, representing seasonal encampments along the same general area of Lee Creek Valley.

Figure 21. 3CW110 log crib looking north

Lee Creek may have been at the base of the upper terrace (if not the lower terrace) during the Archaic occupation, providing a steam bank microenvironment, immediately adjacent to the hill side resources.

The small loci might also represent stations where persons sat adjacent to horticultural crops, similar to 3CW187 and 3CW190 which were found in lowland survey areas A and B during the reconnaissance in 1979 (see above). In the case of those two survey areas and the area around 3CW110, small loci were found in proximity to larger terrace occupations, possibly representing a regular settlement distribution along the second or third terrace lines. Locus 3 contained two of the siltstone tools that might have been employed in preparing and maintaining fields of cultigens.

The conjunction of varied environmental niches at the base of the slope up to the bluff tops was probably a deciding factor in Locus 1A having been the most intensively occupied portion of the site, as shown in artifact density returns within test unit 1 and surface collection units 0-20 and 20-40 m west (densities of about two artifacts for every 10 m^2). Locus 1A may have been a base camp and/or small hamlet or farmstead for its aboriginal inhabitants.

Since only a tiny fraction of the site's area could be inspected with test excavations, and chance did not provide any evidence in

those tests of structural features connected with any of the occupations, the presence or absence of features such as postmold patterns, storage pits, or hearths, cannot be confirmed or ruled out with any assurance. However, heavy cultivation, beyond that done with animal drawn plows, did not appear to ever have been extensively utilized on the site. Features could still be extant at the base of the plowzone shown in the tests on Locus 1A. By digging in restricted levels within soil zone 1 data might be found on some vertical cultural separation. The high return of cultural material in test unit 1 also indicated that extensive artifactual remains are still extant below the surface, with only a fraction represented in the surface collections.

Following the occupation of the region by Euro-Americans the site has probably been continuously used as a farm homestead in approximately the same location as found at the time of the field research.

Research Potential

The variety of loci found on 3CW110 offers opportunity for the investigation of many different research questions. Microenvironmental land use and settlement adaptations are apparent on the site in the size, distribution, and cultural occupations associated with the six loci. The site's situation at the base of the valley slope, with easy access to both the bluff tops and the Lee Creek floodplain may well be unique in the upper Lee Creek drainage; it is the only site in such a situation that is currently known. Bluff shelters are within a few minutes walk from the site (3CW6 and 3CW11). Data is extant on both hunting and gathering and early horticultural practices of subsistence. Better definition of Archaic through late prehistoric peoples would be attained through further study of 3CW110. The later occupations could be fit into the broader settlement systems of the Lee Creek Valley, and their relationship with the Caddoan ceremonial centers in the Arkansas River Valley to the south, particularly to Spiro, in Oklahoma, one of the most elaborate ceremonial complexes ever built in aboriginal America. Lithic use patterns and tool manufacturing techniques could be studied on the site. Of particular importance to understanding early horticulture would be further collection and analysis of the siltstone biface tools.

Additional research on the historic occupation would provide information on historic land use patterns from the earliest pioneers in the area through today. Historic trends in economics and agriculture might be reflected in oral history, documentary and archeological research on the nineteenth and twentieth century inhabitants. The impact of twentieth century technology on land use could be delineated in part through a study of this rural area. In some ways, the dependence of the modern population on Van Buren and Fort Smith in the Arkansas River Valley might be found to be similar to social and economic ties that bound late prehistoric peoples in the Lee Creek drainage to Spiro. In both prehistoric and historic times the topography of the region has oriented the population to larger centers to the south.

Site Recommendations

As the integrity of the site appears to be high, and the research potential is of equal intensity, in the opinion of the Arkansas Archeological Survey this site is eligible for the National Register of Historic Places. A request for determination of eligibility will be required if the project remains active, as Loci 1A, 1B, and 2 would be directly impacted by construction of the dam, as would the historic occupation. Mitigation plans would have to be developed if the site was determined to be eligible.

3CW119

As with 3CW110, this site was recorded in 1975 when surface material was found in a modern garden area (Hurdelbrink et al. 1976: 109-110). The site was about 20 m east of the channel of Lee Creek at the time of the 1979 investigations (Figure 22). A narrow terrace, with a natural levee covered with hardwoods on its southern side, separated the site from the creek. The two terraces that rose above the initial one (designated as the lower and upper terraces) contained the archeological site. To the north the site is bordered by a steep wooded hill. On the south the site ends by a dry wash which appeared to have been Elmo Creek on an 1870 map. The elevation of the site ranges between 210.3 m on the lower terrace and 221 m above sea level at the base of the hill overlooking the upper terrace.

The site was mostly overgrown at the time of the investigations, as the garden was not being cultivated, and the rest of the terraces were in use as pasture. The density of the vegetation cover varied across the site. The west bank of the lower terrace was almost barren, and it was badly eroded by rainwater, revealing a great amount of cultural material. According to the landowner, Charley Cox, this slope had been bulldozed to provide better access for his ford across Lee Creek. The garden was covered with weeds and surface visibility was poor, but Mr. Cox had his son, Martin, plow it for our investigations. Following the plowing and a rainstorm the garden was divided into four roughly equal sized collection units and all visible artifacts were recovered. The rest of the lower terrace had almost no surface visible through the pasture cover, and shovel testing was used to delineate the site limits there.

On the upper terrace the vegetation was very thin, and select collections were made, plotting the distribution of archeological remains. The upper terrace stretched for 215 m west to east, from just north of the garden to a gully on the east side of a stock pond (Figure 22). The maximum width of the surface scatter, which ended on the hill to the north, was 55 m. The estimated area of occupation on the upper terrace was 11,825 m^2. The lower terrace occupation was larger, stretching 165 m west to east and 175 m north to south, an area of about 28,875 m^2, giving a combined site area of 40,700 m^2.

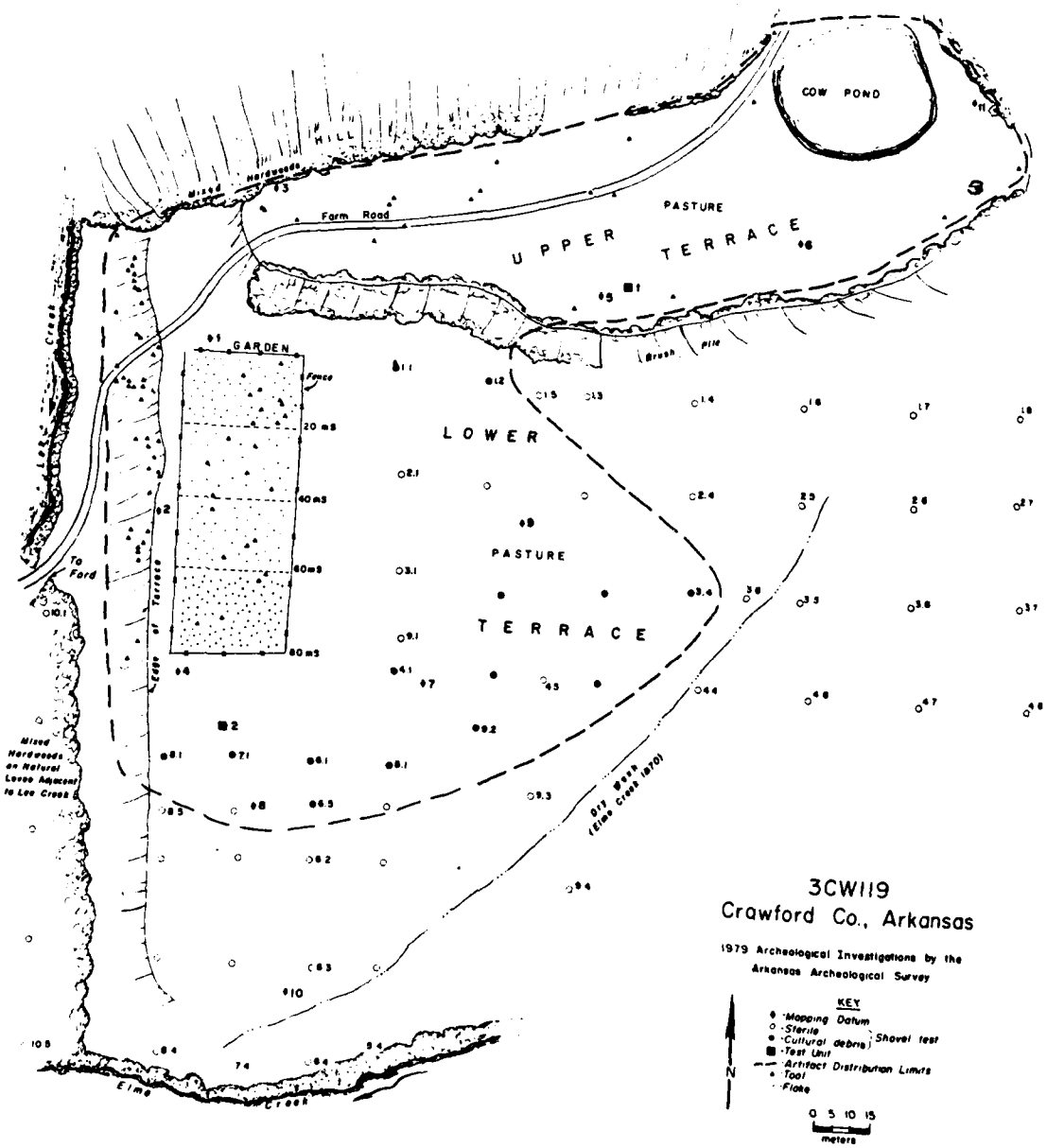


Figure 22. 3CW119 site map

Stratigraphy

The basic soil type shown for the site area on Soil Conservation Service maps was the Spadra fine sandy loam found on all the lowland sites. Shovel tests and test excavation units produced profiles of fine grained deposits that had many rocks in them. The number of rocks decreased to the south in the profiles farthest away from the hill and upper terrace. These rocks had probably been deposited through colluvial action.

Test unit 1 (1 m^2) was placed on the southern edge of the upper terrace to inspect that part of the site's stratigraphy and artifact content. Its placement at the edge of the terrace (Figure 22) was done to avoid the extra overburden that would be found closer to the hill-slope. During excavation of the unit down to a maximum depth of 85 cm below the surface, three soil zones were noted. The unit was excavated in 10 cm levels within the noted soil zones, with three levels in zone 1 (0-27 cm), two levels in zone 2 (27-47 cm), and three levels in zone 3 (42-85 cm). After the excavation was completed and the profiles were cleaned some additional color variation was noted in the walls in zone 2b and 2c (Figure 23). Zones 1, 2, and 3 were all a yellowish red color (5YR 4/6 and 5YR 4/8). The two additional zones noted were strong brown in color (7.5YR 5/8 and 7.5YR 5/6). Below 60 cm the soil was progressively harder to dig in, and by the bottom of the unit the level was more rock than soil.

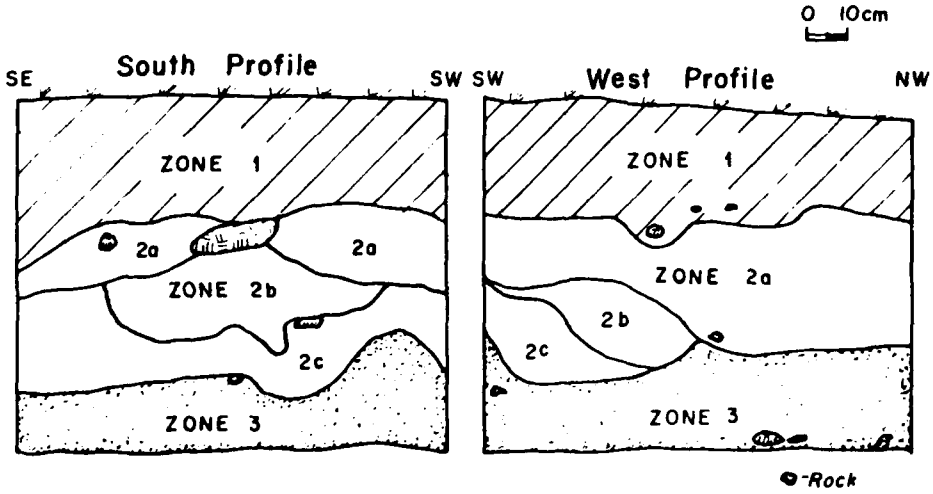


Figure 23. 3CW119 test unit 1 profiles

Table 13. 3CW119 soil sample analysis

Provenience	pH	Organic %O.M.	Parts per million P	K	Ca	Na	Mg	Conductivity ECx10^6
Test unit 1								
zone 1								
L.1	5.0	0.6	10.5	60.0	225	65.0	37.5	68
L.2	5.1	0.4	6.5	30.0	175	40.0	27.5	36
L.3	5.5	0.4	8.0	42.5	250	42.5	37.5	33
zone 2								
L.1	5.5	0.3	10.0	35.0	325	42.5	50.0	27
L.2	5.6	0.5	14.0	35.0	400	50.0	67.5	22
zone 3								
L.1	5.6	0.3	18.0	55.0	525	40.0	100.0	24
L.2	5.7	0.2	20.5	40.0	650	40.0	112.5	18
L.3	5.6	0.2	16.0	30.0	550	45.0	105.0	20
Test unit 2								
zone 1								
L.1	6.2	0.7	5.0	25.0	900	40.0	75.0	42
L.2	6.5	0.6	4.0	22.5	975	50.0	95.0	30
L.3	6.7	0.2	9.0	27.5	900	65.0	110.0	20
zone 2								
L.1	6.2	0.4	15.5	35.0	950	55.0	145.0	20

either test unit, although the fragment of a siltstone tool found at a depth of 22 cm below the surface in test unit 1 might be attributed to the Woodland or later Mississippian periods. Point fragments were found in test unit 1 but they could not be identified with any assurance.

Other than the top zones, which had been cleared and probably cultivated in the past, the zones in the two test units did not correspond directly. Zone 3 in test unit 1 and zone 2 in test unit 2 probably represented the sterile parent soil matrix, with the few cultural remains found in their upper levels being intrusive from above. Further testing would be needed to provide a better interpretation of the greater soil complexity of test unit 2, beyond concluding that undisturbed cultural occupations are probably extant in the deeper debris levels on the upper terrace.

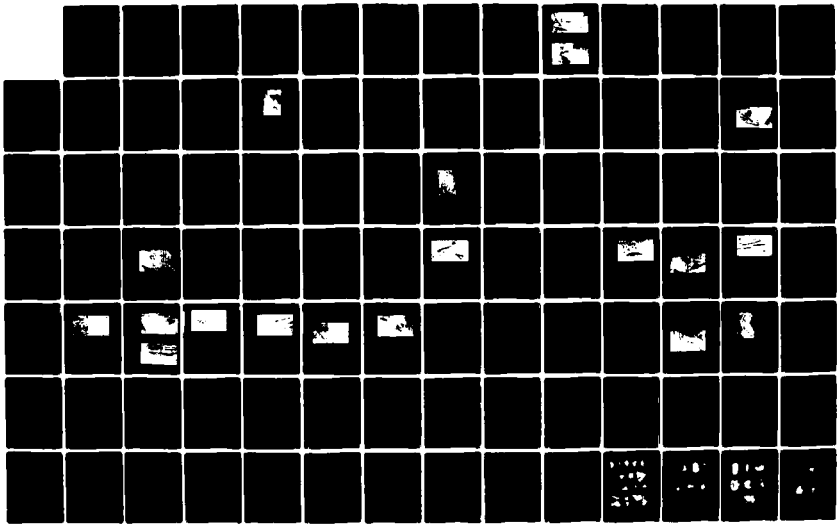
Artifacts

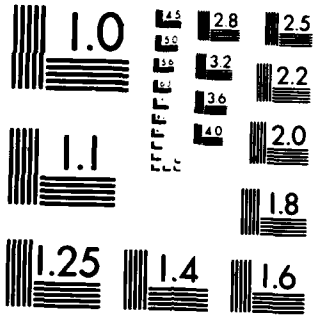
The 1975 research had recovered a variety of artifacts, including a core, 11 bifaces, and 231 pieces of debitage, all from the garden area. Most of this material was made out of Boone chert, followed by siltstone, Pitkin chert, and a possible piece of Penters chert.

Other collections had been made on the property by the landowners, but most of that material was no longer in their possession. However,

AD-A124 246 PINE MOUNTAIN REVISITED: AN ARCHEOLOGICAL STUDY IN THE ARKANSAS OZARKS(U) ARKANSAS ARCHEOLOGICAL SURVEY FAYETTEVILLE N L TRUBOWITZ JUN 80 RR023 2/3

UNCLASSIFIED DACW03-79-C-0078 F/G 5/1 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Table 14. 3CW119 artifact provenience summary

Provenience	Flakes			Modified Flakes			Bifaces						Miscellaneous							
	chert			Chert			Chert													
	Pitkin	Boone	Siltstone	Pitkin	Boone	Siltstone	Pitkin	Boone	Siltstone	Siltstone fossil	Boone uniface	Sandstone hammerstone	Sandstone pitted stones	Pitkin core	Bone cobbles	Pitkin chunk	Penters chunk	Boone chunk	
Upper Terrace																				
Test Unit 1																				
zone 1	2	125	50					7	2											
zone 2	10	58	18							1										
zone 3	1	13	7																	
Select Surface								9	9		1									
SW of T.U.1									1											
Lower Terrace																				
Shovel test																				
1.1	1	1	1																	
1.2												1								
3.2	1																			
3.3			1																	
3.4		1					1													
4.1		1	1																	
4.2			1						1											
4.3			1																	
5.1		1																		
6.1					1															
6.5		1																		
7.1	1																			
8.1		1																		
9.2	1		1																	
Test Unit 2																				
zone 1	6	16	8																	
zone 2		1	6			1														
Select surface: eroded west slope		1		3	1		5	20	9				3	1	2					
Next to ST1.1													1							
Controlled surface:																				
Garden																				
0-20 m S	8	40	7		7			6	2		2		1			1				
20-40 m S	4	14	4					4				1				1				
40-60 m S	6	28	5				1	3												
60-80 m S	9	75	9					3			1						1	1		
Total	50	377	120	3	10	1		52	24	1	4	2	5	1	2	2	1	1		=663

Another late Gary point was found in garden collection unit 40-60 m south on the west side of the garden (Plate 15g). This find was paralleled on the slope to the west by the recovery of two more late Gary style points (e.g., Plate 14c), a fragment of a Langtry point (Plate 14e) and another Woodland period biface (Plate 14g). Together these artifacts may represent a late Archaic to Woodland period occupation locus. Also found in collection unit 40-60 m south was the base of a Reed arrowhead (Place 15f). Such points have been dated between A.D. 500 and 1500 in Oklahoma (Bell 1958:76) where they have been found at sites such as Reed, Morris, Norman, and Spiro. The last arrowhead found was a Fresno or Talco triangle (Plate 15h) that was on the surface at the northeast side of garden collection 60-80 m south. Fresno points are dated between A.D. 800 and 1600 (Bell 1960:14) while Talco points are placed between A.D. 1200 and 1500 (Bell 1958:90).

Of all the sites investigated in 1979, 3CW119 yielded the greatest number of worked siltstone artifacts, mostly large bifaces of Bond's Type I and Type IV (Plate 12f-g; Plate 16a-f) with the addition of some smaller worked tools. These tools were distributed across the site. As noted in other site discussions above, these tools have been experimentally linked with soil grubbing or digging functions and cultural indentifications range from the late Archaic to the Mississippian periods, though most investigators (Hoffman 1977, Bond 1977) in Arkansas have associated these tools with cultures that also had ceramics.

Settlement Pattern

The remains eroding out of the west bank of the lower terrace and the density of artifacts in the garden (between 4.7 and 16.3 artifacts for every 10 m^2) were evidence of the heaviest occupation areas on the site. The northern and southern ends of the garden had greater concentrations of artifacts (Figure 22). Although not as much material appeared on the surface of the upper terrace, the 295 artifacts found in test unit 2, including nine bifaces and a modified flake, were indicative of heavy occupational debris being extant below the surface. Thirteen out of the 60 shovel tests dug in the overgrown pasture on the lower terrace (Table 4 and Figure 22) produced cultural remains at a yield of 21.6%. Not only was this a high return rate, but several tools (Table 14) including two bifaces (one a Type I siltstone tool haft) and a hammerstone were recovered; as already noted such tool recoveries in shovel tests are rare. Their discovery was also an indication of widespread heavy occupation debris.

At the time of the early Archaic occupation it is possible that the lower terrace was not available for occupation, as Lee Creek or one of its tributaries may have run along the base of the upper terrace. By late Archaic times both terraces were visited by hunters and gatherers who left behind dart points from hunting. Camps may have been situated on both terraces. Woodland period occupations, as denoted by the siltstone tools and late Gary points, possibly were the most extensive

on the site according to the distribution of those tools and siltstone flaking debris. Siltstone tools were found all the way to the stock pond, across the lower terrace pasture and concentrated along the eroding west bank and north end of the garden on the lower terrace.

Late prehistoric occupations, marked by the various arrowheads, appeared to have been restricted to the garden/bank area. The site may have been a farmstead or hamlet for Caddoan peoples within Spiro's interaction sphere.

Research Potential

Evidence of prehistoric occupation at 3CW119 was the longest and heaviest of any of the sites investigated in 1979. It apparently was a key part of aboriginal settlement systems throughout the Native American inhabitation of the valley. As such, 3CW119 would be a resource integral to the study of local settlement systems and land use patterns over time. The site is situated in a diverse environmental zone with both hill and lowland resources immediately available. The site overlooked the junction of Lee Creek and one of its major tributaries. The coincidence of these environmental factors were probably the main criteria in the repeated and heavy occupation of the site. Additional research could refine the understanding of how prehistoric peoples made choices about where they lived and what resources they chose to use for their subsistence. The site was singular in being the only large lowland site that was still adjacent to an active bank of Lee Creek; geological investigations in conjunction with archeological excavations could provide data on the processes and rate of terrace formation in the valley, which would have broad application throughout the southern Arkansas Ozarks.

The upper terrace of the site has potential to provide stratigraphic columns for the delineation of culture-historical sequences. The manufacture and use of siltstone tools could be studied, as this site has already yielded many finished tools, fragments of ones that were broken through utilization, and debitage. The distribution of these artifacts might provide clues as to the location and layout of horticultural fields in the vicinity.

The site has received some modification through clearing on the edges of both the lower and upper terraces, but plowing and bulldozing do not appear to have removed too much data. The general horizontal artifact distribution is probably still reflective of the use and discard patterns left behind by the aboriginal peoples who lived and worked at 3CW119. Although no features were found in the limited test excavations, the deeper deposits on 3CW119 offer the best potential within the project area for such evidence of settlment pattern still being extant for study.

Site Recommendations

The site would be lost to flood waters if the Pine Mountain dam is constructed. Based on the data already gathered and the kinds of research that could yet be carried out on the site, in the opinion of the Arkansas Archeological Survey, the site is considered to be eligible for the National Register of Historic Places. If the designated federal and state officials concur that the site is eligible, mitigation procedures would be needed.

Shelters Investigated Through Testing

3CW6 TIDWELL HOLLOW BLUFFS

A series of shelters have formed on the north face of Pine Mountain, where the softer shales interbedded with layers of hardened sandstone (both part of the Atoka formation) have eroded, leaving overhangs of fine to medium grained rock. In 1934 Henbest collected artifacts from two shelters on this face of the mountain, and left a general location map showing the overhangs there.

In 1979 the investigation of that part of Pine Mountain revealed three new overhangs in addition to the two investigated by Henbest. The five shelters were given letter designations of A through E (Figure 25) in order of their 1979 investigation. Shelters E and C were designated as Henbest's first and second shelters respectively. His two shelters were identified on the basis of floor plans and photographs left by Henbest and his description of the relationship between the second overhang and the first one: "this bluff is 400 yards east of the first bluff we worked on this farm [Tidwell]" (Henbest 1934:51). A 1934 photograph (Figure 26) showed a view of an overhang that was relocated in 1979 in Shelter C (Figure 27). Although there have been additional rock falls from the roof of the shelter since 1934, distinguishing characteristics of the rock formation were extant in 1979. It was also apparent that much of the floor of the shelter has eroded away since 1934, leaving a smaller potential occupation area in 1979 than had existed in 1934.

The identification of this shelter as the second one tested by Henbest was confirmed by its distance from Shelter E, the overhang farthest to the west; Shelter E was Henbest's first shelter, as its floor plan (Figure 28) corresponded with the map made of it in 1979 (Figure 29) and testing confirmed the presence of archeological deposits (see below). Again there appears to have been additional rock fall since 1934.

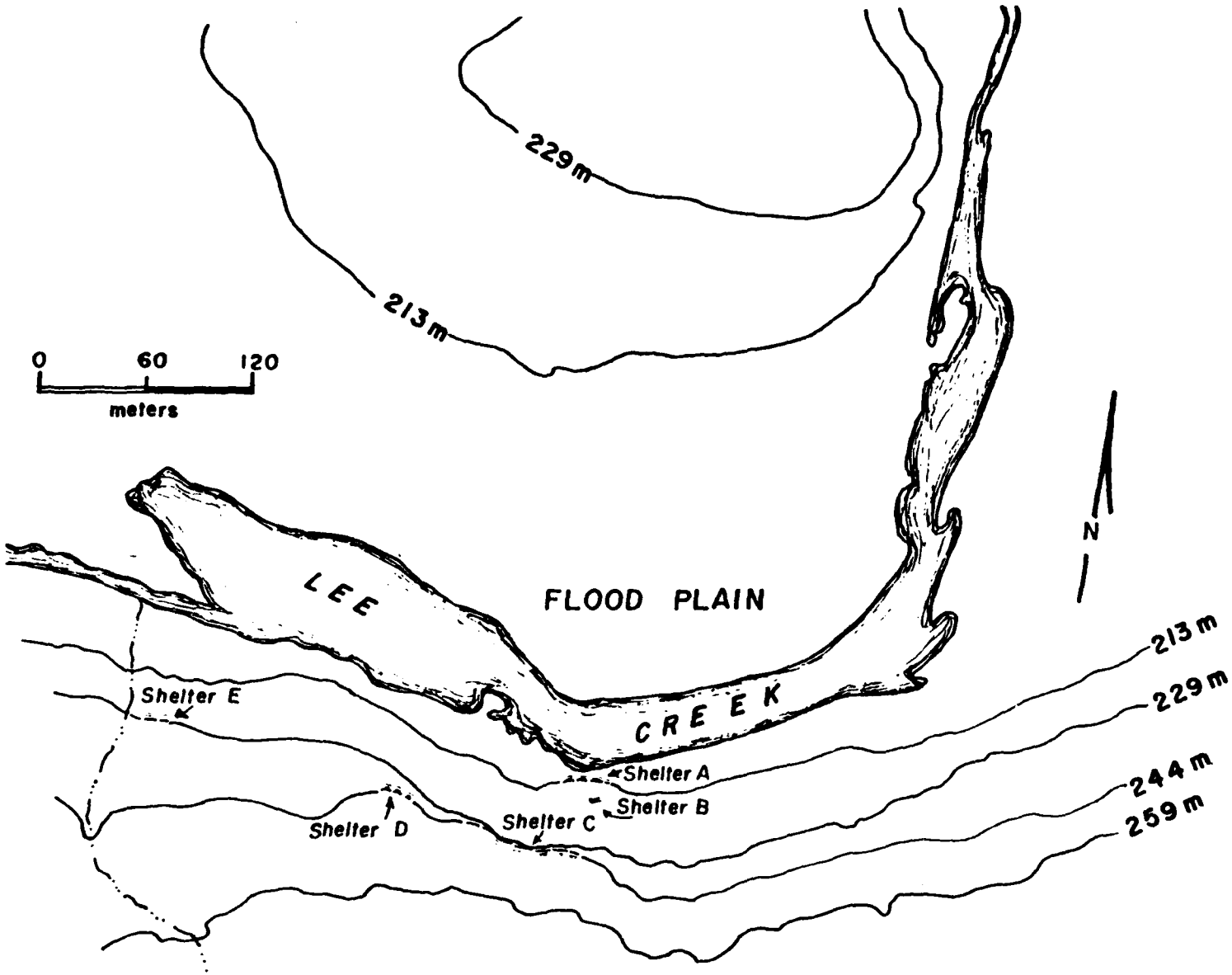


Figure 25. 3CW6 shelter distribution in 1979

Figure 26. 3CW6 Shelter C looking west, 1934

Figure 27. 3CW7 Shelter C looking west, 1979

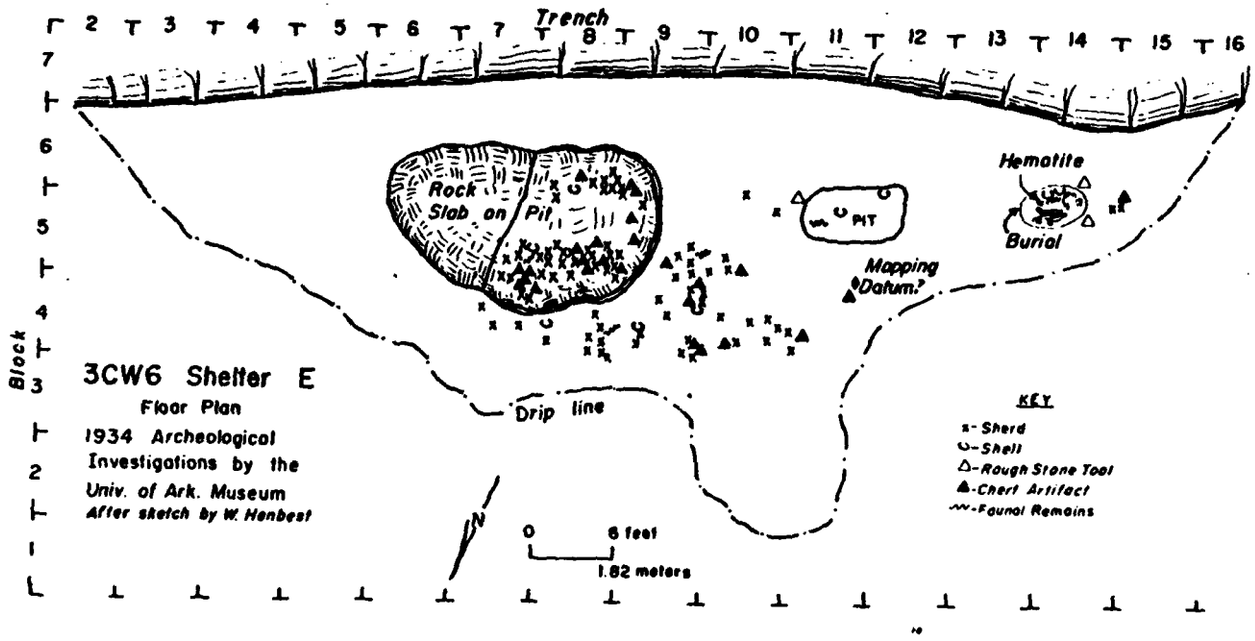


Figure 28. 3CW6 Shelter E 1934 floor plan

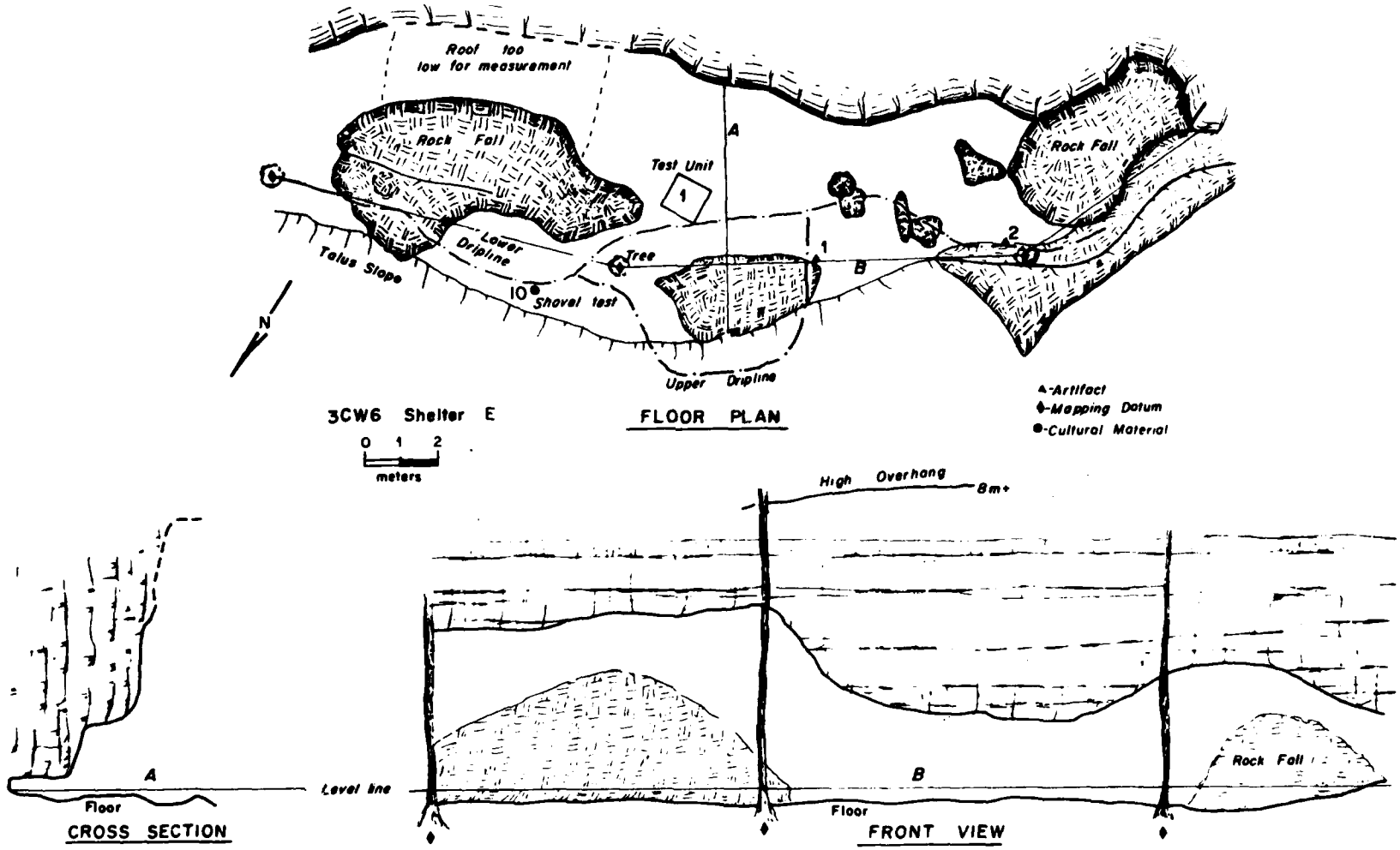


Figure 29. 3CW6 Shelter E 1979 maps

Except for Shelter A at an elevation of about 204.2 above sea level, the shelters overlooked steep slopes above Lee Creek. Shelter B is intermediate in elevation at 222.5 m, while Shelters C, D, and E are highest, with floors between 224 and 228.6 m above sea level. The sandstone and shale layers on the mountain contain some inclusions or laminations of the other rock, giving the slopes a uniform dark gray to black color. The slopes were completely wooded and covered with rock fall at the time of the 1979 research.

Shelter A was about 45.5 m long and 8 m wide, with a roof about 9 m high (Figure 30). Shelter B was the smallest of the overhangs (Figure 31), with a width of 2.1 m, length of 9.6,, and height of only 1.4 m. The largest of the overhangs, Shelter C, had a length of approximately 86.8 m and a width of 6 m at the greatest. The ceiling was too high for direct measurement. Only a portion of this shelter produced remains in 1934 (Figure 32). Shelter D was west of Shelter C, was 14.6 m long, 4 m wide and 12 m high (Figure 33). Shelter E was 24 m long, 6.9 m wide, and had a ceiling of 8 m or greater on a upper level overhang, below which a lower ceiling of 2.1 m was found along the back of the shelter.

The 1979 Testing

A series of tests were dug in the shelters in 1979 to determine what archeological remains might still be there. A 4 x ½ m trench was excavated in Shelter A, and 10 shovel tests were spread in the other four shelters and on the small terraces below them. Shovel test 1 was dug in Shelter B, numbers 2, 3, 7, and 8 were put into Shelter C, number 4 in Shelter D, numbers 5 and 6 below Shelter C, and numbers 9 and 10 were in Shelter E. Shovel test 9 was expanded into test unit 1 (1 m^2), when cultural material was found in it.

Stratigraphy

Shelter A. The trench in Shelter A (Figure 34) showed a profile of flood deposits mixed with rock falls (Figure 35). Ultimately these rock falls prevented the test unit from being dug more than a meter below the surface, as they could not be removed with the available equipment. Zone 1 in test trench 1 was a fine sand lense that was pale brown in color (10YR 6/3). It was deepest at the rear of the shelter (40 cm) and shallowest towards the front (37 cm). Zone 2 was a brown (10YR 5/3) sand that extended as far as could be excavated. A thin pebbly sand lense separated zones 1 and 2 in the front of the trench. It was a dark brown color (10YR 4/3). In the south end of the trench, at the rear of the shelter, bottle glass and a tin can lid were found near the bottom of the excavation. These artifacts are probably not more than 40 years old, indicating a recent average accretion rate of 2.5 cm per year for the floor deposit, from both roof fall and flooding.

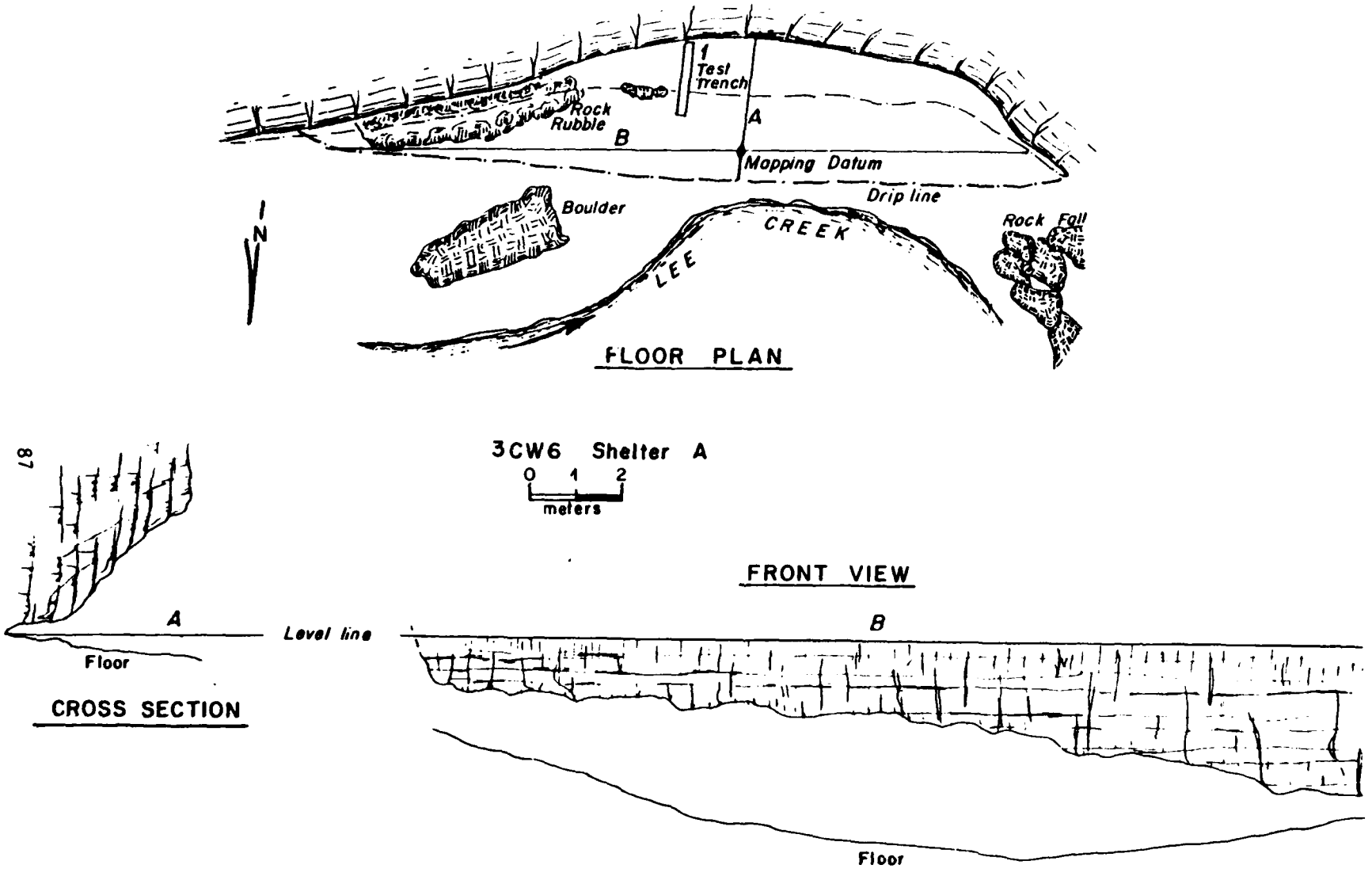


Figure 30. 3CW6 Shelter A maps

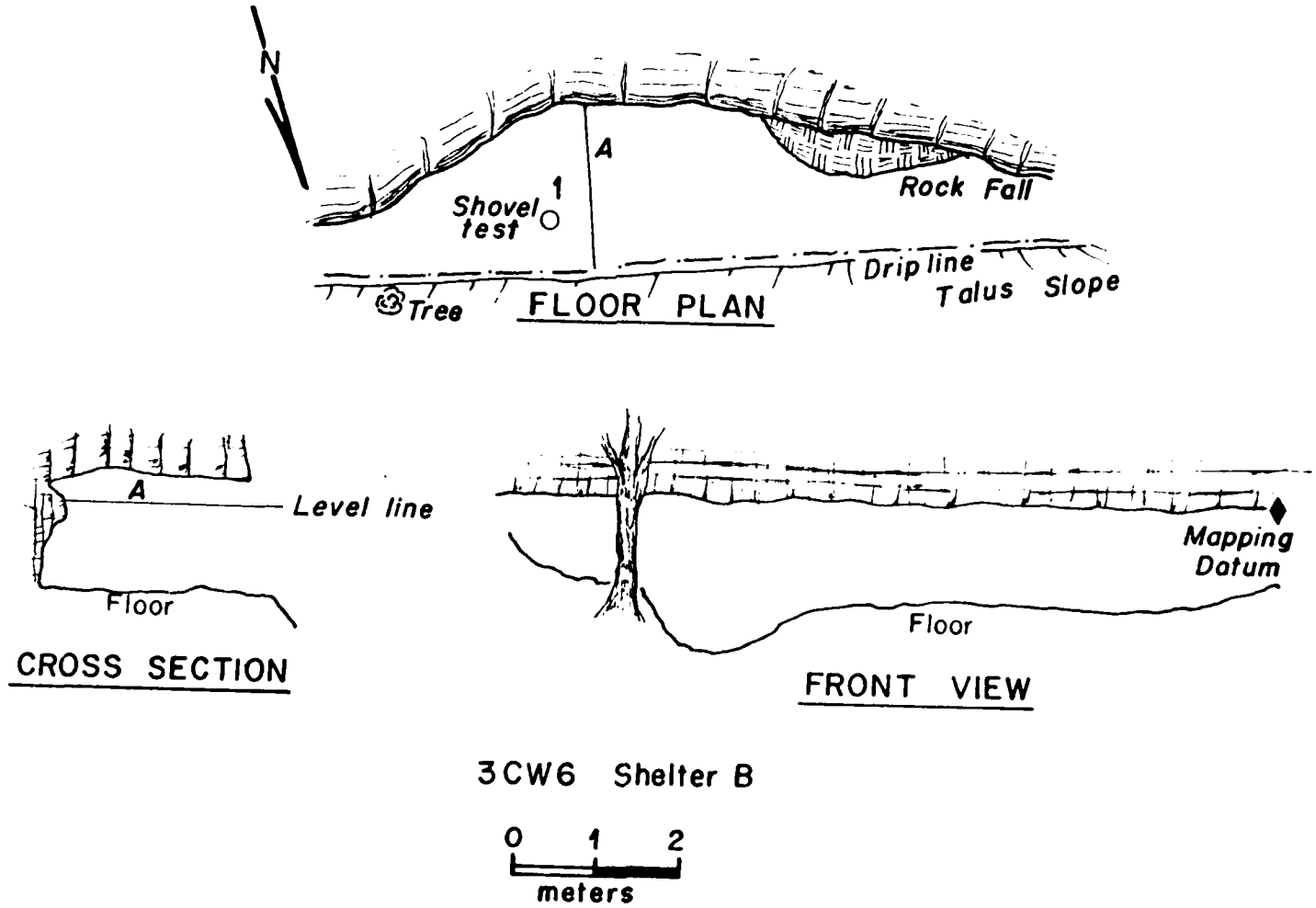


Figure 31. 3CW6 Shelter B maps

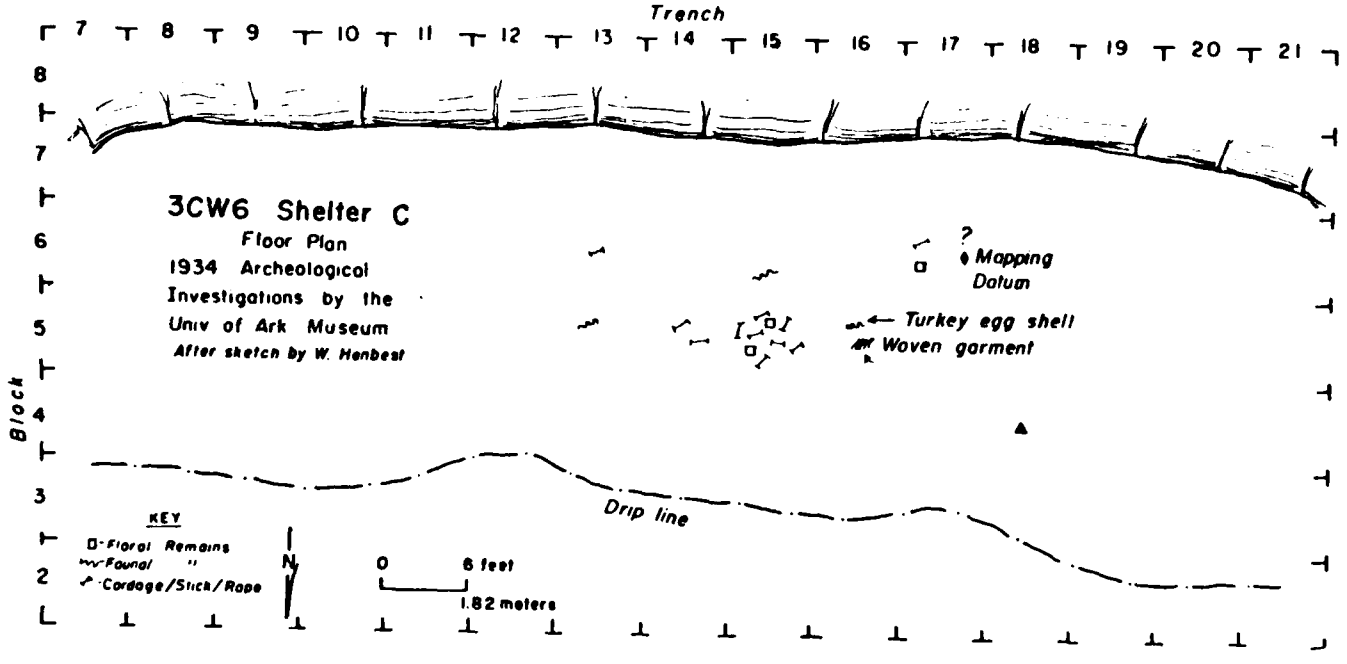


Figure 32. 3CW6 Shelter C floor plan

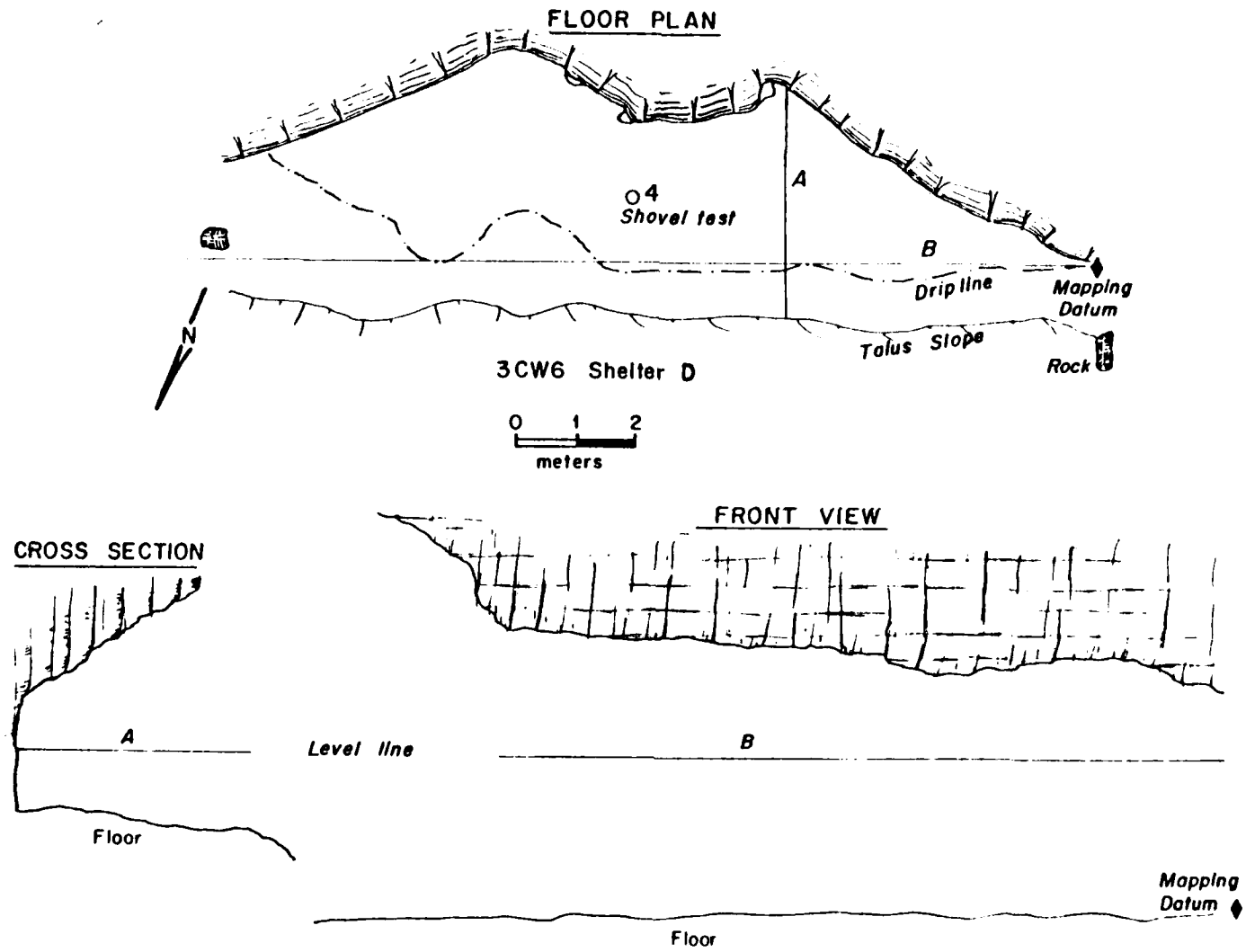


Figure 33. 3CW6 Shelter D maps

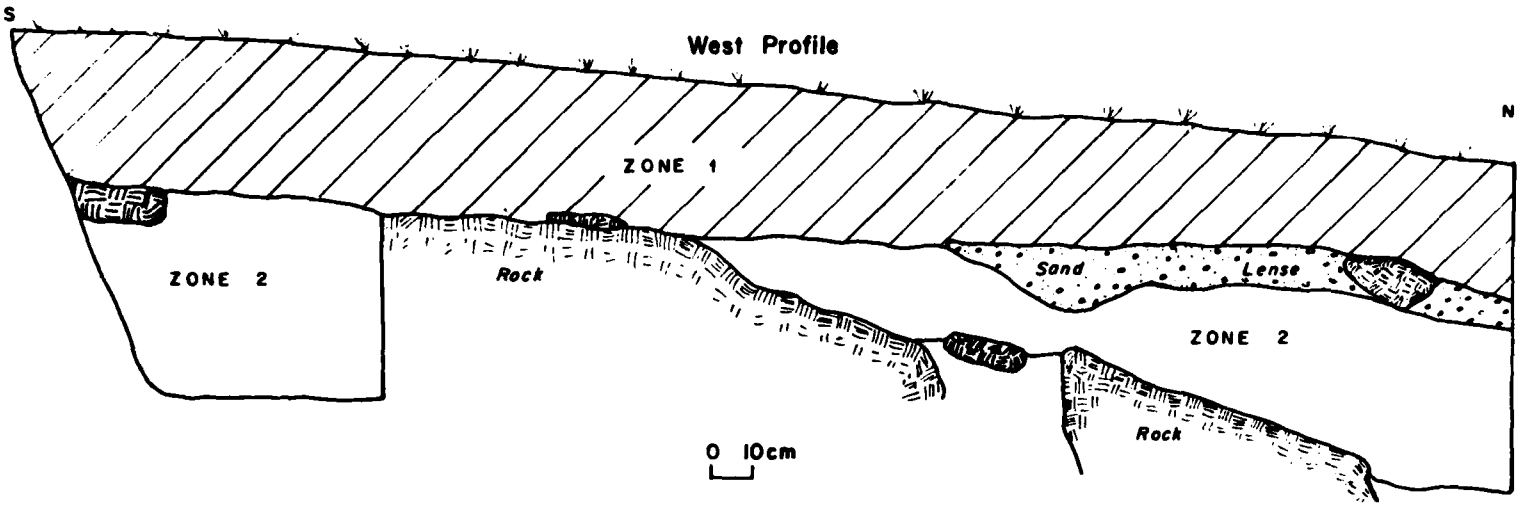


Figure 34. 3CW6 Shelter A test trench 1 profile

Figure [illegible]. Site Shelter A, looking east. Test trench in progress in floor deposits. Note active dripline.

Shelters B, D, and E. Shovel test 1 in Shelter B was excavated to a depth of [illegible] cm below the surface, as it would have to be enlarged to go deeper. This was not done as cultural evidence was absent and time limited. The very dark soil with much exfoliated sandstone was found in this test. Similar deposits were found in the shovel tests in Shelters D and E and on the ledge below Shelter D. The gray color of the deposits varied somewhat according to the amount of sandstone and shale found in the tests.

Shelter E. In Shelter E test unit 1 was excavated down to shale bedrock (Figure [illegible]). The deposit, more of a rock dust than a soil, was gray (10YR [illegible]). A small lense of light olive brown soil (2.5YR 5/3) was found in the south wall profile. The single zone in the profile was a maximum of [illegible] cm deep. Hempel has described the deposit as being between [illegible] and [illegible] inches deep ([illegible] cm). Shovel test 10 in Shelter E was dug outside the dripline. It was the only test unit that revealed a humus in the profile, which probably has built up from materials that had fallen off the top of the fountain cliff. The moist dark gray black soil extended to a depth of [illegible] cm below the surface, below which the unit could not be extended because of the rock.

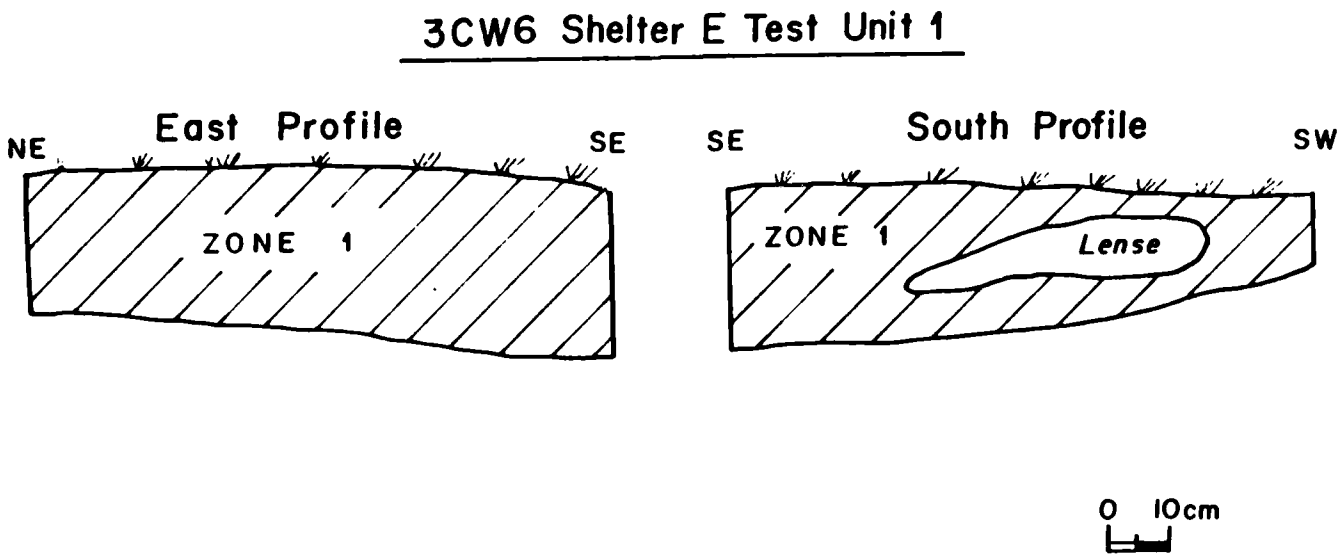


Figure 36. 3CW6 Shelter E test unit 1 profile

Soil Samples

Soil samples were collected in Shelters A and E and analysis of the samples confirmed the difference between the deposits in those shelters (Table 15). Shelter E, high on the side of the mountain, was more alkaline than the lower shelter. Its soil matrix also had a higher organic content and more phosphorous, potassium, and calcium than the flood deposits. Its conductivity was much greater also.

Table 15. 3CW6 soil sample analysis

Provenience	pH	Organic %O.M.	Parts per million P	K	Ca	Na	Mg	Conductivity ECx10^6
Shelter A								
Test trench 1								
zone 1	6.9	0.3	2.5	47.5	725	72.5	250	40
zone 2	6.6	0.3	7.5	42.5	1200	90.0	175	56
Shelter E								
Test unit 1								
zone 1	8.2	1.2	11.5	250+	2300	120.0	250	420
Shovel test 10	7.8	0.7	28.0	125	2200	70.0	120	100

Artifacts

The 1979 collection. No cultural remains were found in either Shelters B or D in 1979. Shelter A produced only recent historic debris, although prehistoric occupation might still be buried well below the rock falls encountered in test trench 1. In Shelter C, a single possible prehistoric artifact, a bone bead, was found in shovel test 2, along with a metal shotgun shell case. Test unit 1 in Shelter E produced cultural material throughout its 30 cm of accumulation above the bedrock floor, and shovel test 10 also yielded a flake in the first 30 cm of its profile. Additional cultural material was unlikely to exist below that depth in most of Shelter E due to the rock floor.

Test Unit 1 in Shelter E was the main source of artifacts in the 1979 research. Thirteen unmodified flakes, 1 modified flake (Plate 18b), 2 bifaces, 7 body sherds, 32 pieces of mussel shell, and 11 charcoal fragments was the total artifact recovery in that unit. In addition to this material, and the one flake found in shovel test 10, four unmodified flakes, two modified flakes (e.g., Plate 18a), and one biface were found in the surface of Shelter E. All of the lithics were made of Boone chert with the exception of one Pitkin chert flake found in test unit 1. The surface biface was a triangular arrowhead resembling a Fresno type (Plate 18c). The other bifaces were a possible triangular point in process and a hump-backed tool that showed use on its edges (Plate 18d). Five of the sherds recovered were shell-tempered, and the other two were grog-tempered. They

have been identified as four Woodward Plain (Brown 1971)(e.g., Plate 18h), one c.f. Mississippi Plain var. Coker (Phillips 1970)(Plate 18g), and two Williams Plain (Plate 18e-f). One of the Woodward Plain sherds had a possible node on it (Plate 18i). Similar nodes were on the body of a vessel found across Lee Creek in 3CW11 (Dellinger and Dickinson 1942:Plate XXVI,e).

The 1934 collection. The inventory of artifacts from Shelter C in the 1934 collections (Table 16) included a woven garment that was not with the rest of the collection in 1980, a long bone awl (Plate 19b), four sticks with plant fibers knotted around them, several pieces of used cane (e.g., Plate 19a), and a broken Sequoyah arrowhead made of Boone chert (Plate 19g). One of the pieces of cane was identified by Gilmore (1936b) as Arundinaria macrosperma. The sticks were wrapped with a hard plant fiber that had been shredded and tied around the sticks without further processing into a finished cord or string. One knot was tied with a half hitch (Plate 19d), another with two half hitches (Plate 19f), the third was an overhand knot (Plate 19c), and the fourth was a double overhand knot (Plate 19e). Strips of raw fiber were also present, including one knotted into an overhand tie but not wrapped around a stick. This piece of fiber was identified by Gilmore as a piece of leaf of Eryngium yuccifolium (yucca). Another piece of the raw material that was not knotted was also identified by Gilmore as a yucca blade.

Other floral and faunal remains, some of which have not yet been studied, were found by Henbest in Shelter C. The seeds from trench 17, block 6, were identified by Gilmore as long necked pumpkin, Cucurbita moschata. Jerry Hilliard identified one acorn of red oak (Quercus sp.) and two bur oak acorns (Quercus macrocarpa) in the collections from Shelter C. Charles Cleland identified turkey egg shell (Meleagris gallopavo) in the collection in his rough notes (n.d.)

The cultural materials found in the 1934 collections in Shelter E (Table 17) were quite different from those found in Shelter C. Ceramics outnumbered all other artifacts, and no plant materials were recovered. The lack of floral material was probably due to a difference in the moisture content of the two shelters; Shelter C was dry, while Shelter E was not. However, the different artifact inventory could also reflect different functions for the two shelters. The total inventory of Shelter E included 10 rim sherds, 66 body sherds, 2 lower body sherds, 12 basal sherds, 3 sherds in the original field catalog that were not present in 1980 and could not be classified, 3 metates (not present), a concretion, 9 modified flakes, 12 bifaces, 3 cores (with use wear), some modified and plain mussel shell, a woodchuck incisor, another animal tooth, a snail shell bead (Plate 20i), the tip of a bone tool, turtle shell, and the opercular plate of a fish.

Two of the modified shells (e.g., Plate 20j) had a hole punched in each, possibly to prepare them for hafting as digging/grubbing tools. Hafted shell hoes have previously been found in Ozark bluff shelters (Harrington 1960:Plate V). Carapace of both the common and ornate box turtle (Terrapene carolina and Terrepene ornata) were identified (Cleland n.d.). Except for a flake core (Plate 20e) and two of the modified flakes (Plate 20f-g) made out

Table 16. 3CW6 Shelter C (1934) artifact provenience summary

Trench Number	Block Number	Depth (cm)	Floral Material	Boone Chert Artifact
13	5	38.1	seeds	
		29.2-61	used cane	
		50.8	used cane	
		61	used cane	
		66	stick with knot	
		76.2	long bone awl	
		78.7	stick with knot	
14	5	33	yucca blade	
		35.6	bark and cane	
15	5	25.4	hickory bark	
		27.9	knot	
		33	hickory bark	
		40.6	nuts	
		45.7	3 acorns	
		55.9	stick with knot	
15	6	25.4	turkey egg shell	
16	5	25.4	woven "outfit"*	
		48.3	turkey egg shell	
17	6	20.3	stick with knot	
		38.1	seeds	
18	4	40.6		1 arrowhead

* = not in collection in 1980

Table 17. 3CW6 Shelter E 1934 artifact provenience summary (continued)

Trench Number	Block Number	Depth (cm)	Floral Material	Faunal Material	Chert Artifacts: Modified Flakes	Chert Artifacts: Bifaces	Chert Artifacts: Cores	Groundstone Tools	Ceramics: Rim	Ceramics: Body	Ceramics: Lower Body	Ceramics: Base	Ceramics: ?	Other
7	4	7.6				1 chert*								
		10.2								2				
		25.4							1					
		27.9				1 Boone								
		33			1 Pitkin									
7	5	10.2							1					
		12.7								1				
		17.8		modified shell						1				
		20.3							1					
		22.9			1 Boone									
		27.9		1 woodchuck incisor						2				
		30.5								1				
		38.1								1				
7	6	35.6								1				
8	4	5.1								1				
		7.6		1 tooth, 1 shell						1				
		15.2								1				
		17.8								1				
		20.3									1			
		25.4								1	1			
		27.9										1		
8	5	0								1				
		25.4								1				
		27.9				2 Boone				2		2 (1*)		
		30.5								1				
		33			Boone					2		1		
		34.3								1				
		35.6								3				
		38.1				1 Boone				2		1		
		40.6							1	4		1		
		43.2								3				
		45.7							1					
8	6	12.7				1 chert								
		15.2								1				
		17.8								1		1		
		20.3										1		
		25.4								1				
		27.9								2				
		30.5		1 shell						1			1 *	
		33		bone tool tip										
		38.1								1				

Table 17. 3CW6 Shelter E 1934 artifact provenience summary (concluded)

Trench Number	Block Number	Depth (cm)	Faunal Material	Chert Artifacts: Modified Flakes	Chert Artifacts: Bifaces	Chert Artifacts: Cores	Groundstone Tools	Ceramics: Rim	Ceramics: Body	Ceramics: Lower Body Base	Ceramics: ?	Other
8	6	43.2		1 Boone					1			
		45.7							1			
		48.3			1 Boone				1			
9	4	0							1		1 *	
		7.6						1			1 *	
		12.7	2 modified shells			2 Boone			1			
		15.2						1				
		17.8						1	1			
		20.3		1 Boone						1		
		30.5								1		
9	5	12.7							1			
		15.2	fish bone									
		17.8			1 Boone				1			
		22.9								1		
		25.4		1 Boone	1 Boone							
		30.5								1		
		?							2			
9	6	45.7				1 Pitkin						
10	4	0		1 Boone								
		2.5							1			
		7.6							1			
		10.2							1			
		15.2							2			
		17.8			1 Boone				1			
10	5	2.54							1			
		5.1							1			
		10.2		1 Boone					1			
		25.4							1			
10	6	35.6							1			
11	4	0		1 Pitkin					1			
		2.54			1 Boone							
		7.6									1 *	
11	5	25.4	2 shells (1 modified) shell									
		27.9	turtle shell									
11	5-6	17.8					1 metate *					
12	6	27.9	snail bead									
13 & 14	5-6	25.4	animal bones#									adult burial
14	5	12.7					1 metate *					
		15.2						1	1			
14	6	15.2					1 metate *					
		33	1 shell									concretion
		35.6	1 modified shell									
		38.1										
15	6	7.6	3 shells (1 modified)									*= not in collection in 1980
		45.[illegible]			1 Boone							
Total				9	11	4	3 *	10	66	2 12	4	

of Pitkin chert, all the chipped stone artifacts still in the collection in 1980 were made out of Boone chert. Three of the bifaces were stemmed (Plate 20a-c). One point was heavily used and reworked (Plate 20b). Only one of the stemmed points, a basal fragment, was tentatively typed; it was similar to Gary or Langtry points (Plate 20c). One other point has not been identified as it had been extensively reworked (Plate 20d).

Ten ceramic types were identified by Phyllis Marie Clancy (Table 18), based on comparisons to several sources, notably Dellinger and Dickinson (1942), Phillips (1970) and Brown (1971). Most of the sherds were shell tempered, followed by grog tempered in frequency. Some of the grog-tempered sherds also contained grit. Bone may have been present in both some of the shell- and grog-tempered sherds, but acid tests have not yet been made to confirm this.

Woodward Plain was the most common ceramic type. Five Woodward Plain rims included "expanding flat," (Plate 21e), "expanding rounded," "rolled flat," (Plate 21f) and "direct rounded" forms according to Brown's terminology (1971). In Brown's base terminology, the Woodward Plain bases included two that were "rounded undefined" (Plate 22c,e) and seven that were "defined flat" (e.g., Plate 22a-b,d). These rims and bases probably were from shallow bowls. Straight-necked bottles and large everted rim jars could also be represented among the Woodward Plain sherds. The Paris Plain rim had a "direct rounded" (Plate 21a) form indicative of a large everted rim jar, while the two Paris Plain basal sherds were "defined flat" (Plate 23a) or intermediate between "defined" and "stilted" (Plate 23b) indicating a bowl, straight-necked bottle, or seed jar. Three rims of cf. Mississippi Plain var. Mound Field, included "expanding flat" (Plate 21c) "expanding rounded" (Plate 21d) and "direct rounded" lips. These sherds were possibly from bowls. A rim that can be compared with Mississippi Plain, var. Coker, had a "direct rounded" rim (Plate 21b). One possible rim sherd of the Bell Plain type had a direct rounded form which probably came from a bowl.

Table 18. 3CW6 1934 ceramic collection

Ceramic Type	Temper	Rim	Body	Lower Body	Base	Total
Woodward Plain	shell/grit ?	5	31	2	10	48
Poteau Plain	shell/bone?		1			1
Paris Plain	grog	1	2		2	5
Bell Plain	shell	1	3			4
cf. Mississippi Plain var. Mound Field	shell	3	7			10
cf. Mississippi Plain var. Coker	shell		8			8
William Plain	grog		7			7
LeFlore Plain	grog/grit		3			3
cf. Baytown Plain var. Percy Creek	grog/grit		1			1
Undesignated Plain	grog/grit/bone?	1	2			3
Total		11	65	2	12	90

Decorations were not positively observed on any of the 1934 sherds, although one of the direct rounded Woodward Plain rim sherds may have had a scalloped edge and one other Woodward Plain sherd has some kind of applique that resembled a pottery coil or one of the raised fillets that Dellinger and Dickinson illustrated (1942:Plate XXVI,a). One sherd of Poteau Plain with a red slip was included in the 1934 collection. No impressions of basketry or cordage, as have been found in other cave area ceramics (Dellinger and Dickinson 1942), were found in the ceramic collection from 3CW6.

Features

The 1934 investigations uncovered the remains of a human burial in Shelter E (Figure 37). The flexed burial was described as follows:

Figure 37. 3CW6, Shelter E burial in situ

This burial was made in a shale bed which was a pit with straight sides [and] at the bottom was flat. There were two used mussel shell ornaments and a metate which was well worn. The skeleton was decayed very badly (Henbest 1934:38).

David Jurney described these remains as the

> complete upper portion of a cranium, minus temporal, lower frontal, and lower occipital areas. The right tibia is deformed ("sickle"-shaped), possibly indicating pathology. Age and sex indeterminate. Cranial sutures were completely closed, suggesting a young adult (Downing et al. 1976:45).

Also accompanying the burial were several animal bones, which were not in the museum collection in 1980, and a piece of hematite. The shells and bone may have represented a food offering.

Two other pits were also found in the 1934 research. The larger of these contained ceramics, mussel shell, lithics, and animal remains. The smaller pit contained the snail shell bead, a modified mussel shell, and turtle remains. A mass of similar snail shell beads accompanied a burial found in 3CW11 across the creek from 3CW6. Among the ceramics in the large pit was a Woodward Plain basal fragment, which was found to fit another basal sherd that was recovered about 2 m away outside the pit. Both artifacts were found 30.5 cm below the surface.

Cultural Identification and Distribution

In Shelter C the only diagnostic artifact recovered was the Sequoyah arrowhead. Such points have been dated between A.D. 1000 and 1350 at the Spiro site in Oklahoma (Perino 1968:88).

The latest projectile point found in Shelter E was the Fresno recovered in 1979. The established time span for such artifacts is between A.D. 700 and 1700 in Oklahoma; they were replaced by metal triangles after contact with Europeans (Bell 1960:44). The base of the Gary or Langtry point could date from the late Archaic period through A.D. 1000. The remaining point bifaces were not assigned to a point type, but they may possibly be Archaic forms, making them the oldest lithics on the site.

The ceramics in Shelter E dated from the Woodland or Coles Creek period through the Late Mississippian period according to their type definitions. Williams Plain ceramics have been placed from the Fourche Maline phase, through the Evans phase, to the Harlan phase (A.D. 1000 - 1200/1250) at Spiro (Brown 1971). LeFlore plain ceramics accompanied the Williams Plain ceramics in the Evans and Harlan phases. The latest prehistoric occupation represented by the ceramics was the Spiro phase (A.D. 1200-1400), which included Woodward Plain, Poteau Plain, Paris Plain, and Bell Plain.

Unfortunately, there was no clear vertical separation between these diagnostic materials in terms of their recorded depth below the surface. The earlier grog-tempered ceramics were found closer to the surface than some of the later shell-tempered sherds. The few grog-tempered sherds that were probably in situ when they were found in 1934, were mostly in

the upper 30 cm of cultural deposits. As there was a predominance of later ceramics in the pit found under the large rock slab, it was suggested that the occupation level at which the people using grog-tempered ceramics had lived was shallow, and that later Caddoan people had dug the pits through the earlier occupation level, mixing in some of the earlier material with their own debris. The later origin of the pit was suggested also in trench 7, block 4, where shell-tempered ceramics were found within the pit, and grog-tempered ceramics were exterior to the pit.

The ceramics compared with Mississippi Plain, of the Mound Field and Coker varieties and the Percy Creek variety of Baytown Plain posed an interpretive problem. These sherds were visibly different from the other plain ceramics, particularly the Mound Field and Coker varieties which were more finely made than the other shell tempered sherds of Woodward Plain. Although "imported" ceramics were common at Spiro, no ceramics described by Brown (1971) appeared to match these finer plain wares, and the closest descriptions were found in Phillips's (1970) discussion of lower Mississippi Valley pottery. One interpretation for this was that these finer sherds could indeed be imported materials, but other explanations are possible. These sherds may have simply been more carefully constructed than most of their plain ware counterparts. They could also represent variation between individual potters. However the four sherds of Bell Plain were most likely trade items, as only one vessel of this ceramic type was noted by Brown at Spiro (Brown 1971:151).

Together the lithics and ceramics suggested occupations in Shelter E dating between 1000 B.C. and A.D. 1400 at the latest. The occupation at Shelter C was probably restricted to a late Caddoan group.

Settlement Patterns

The kind and distribution of artifacts in Shelters C and E were very different. The preserved food remains with just a few tools nearby, (a stone arrowhead, a bone awl, and some used cane) that were found in Shelter C may have been a small cache of food stock that had largely been used up and abandoned.

[illegible] storage facilities were prepared at Shelter E in the two [illegible] pits, along with the recovery of matching sherds within and outside the [illegible] pit [illegible] indicate that its ultimate function was for trash [illegible]. Some of the ceramics were probably storage jars or bottles. The [illegible] fragments may also have been part of containers; at 30Wil, [illegible] a little shell filled with food remains was found in the [illegible] pit. Shelter E was occupied at least while the pits were being pre-[illegible] filled. The findings in [illegible] 1973 indicated that some tool [illegible] was left at the site, while the variety of [illegible] recovered tools was representative of manufacturing or [illegible] activities.

The burial in the shelter was probably also associated with the latest aboriginal occupation. As the shelter was not dry, bone preservation was very poor; only the most recent bone left at the site may have survived to 1934. However, the mussel shell in the burial may have contributed to the better preservation of other faunal remains in that pit.

There was no good evidence of seasonality of occupation in the shelters, but, based upon the 1979 field crew's winter experience at 3CW6, winter habitation appeared unlikely due to the refrigerator quality of the north face of Pine Mountain. Sunshine never touched any of the shelters; they were in shadow throughout the day. Fires were built to warm the crew's hands for work, but the wind blowing across the face of the shelters prevented the fires from heating the overhangs except in the immediate vicinity of the flames. The cold did make the shelters into good storage areas, though, particularly in Shelter C, which was a dry shelter.

Some infrequent habitation probably took place in Shelter E, but at warmer times of the year. The ravine immediately to the west of Shelter E provided relatively easy access up the face of the mountain, for either people or deer, so Shelter E might have functioned as a hunting station at times. The recovery of the triangular arrowhead supports this theory. Both Shelters C and E had narrow occupation floors, and little cultural material was found overall, indicating that the occupations were not long lasting or were by small groups of people.

Research Potential

The bulk of the 1934 botanical remains and the mussel shell are awaiting identification of genus and species. Ceramics could be studied further to provide statistics on temper characteristics, answers to questions of imported ceramics (see above) and potential clay sources. Additional vessel reconstruction may also be possible. The skeletal remains might provide additional information on the size and health of the individual who was buried in Shelter E.

In Shelter A there were no prehistoric remains within the first meter of deposits. It is unlikely to contain perishable remains due to its frequent flooding, which may have discouraged any long term occupations. However, it could still contain stratified deposits important to defining the local cultural sequence. Shelter B was very small and was unlikely to have sheltered more than a couple of people if it was ever occupied. While Shelter C was very long, it had a very narrow occupation ledge. Since 1934 much of the ledge's dirt covering had eroded away, leaving very little area intact that could still contain cultural remains.

The 1934 investigations found little in Shelter C, and the 1979 research found even less; it was concluded that Shelter C probably no longer has much research potential. Shelter D yielded no evidence of occupation.

Of all the shelters on 3CW6, Shelter E definitely still contained prehistoric cultural remains. Test unit 1 was placed in an area that had been investigated by Henbest and his crew according to the sketch map, but additional artifactural debris was recovered. Most important of these materials were the small pieces of lithic debitage which had been ignored in the 1934 collections. The recovery of the remaining debitage and other materials could augment the already extensive artifact inventory of a small shelter, which would be of great value in studying a variety of research questions, including internal activity patterning, site function, and its place in local settlement systems. The site's relationship with Spiro with which it had several varieties of ceramics in common, would also be of importance in defining Caddoan settlement systems.

Site Recommendations

If the reservoir is constructed, all five shelters at 3CW6 would probably be destroyed, either through construction activites (the dam centerline crosses Lee Creek near Shelter C) or the indirect effect of construction personnel having access to the shelters. Shelters B, C, and D are unlikely to yield additional data of significance and no further work is recommended on them.

Shelter A is considered to be worthy of further research as it still has the potential to contain a stratified sequence of cultural remains buried by rock falls and flood deposits. This overhang, which was recorded in 1979 for the first time, requires deep testing to see if prehistoric remains are extant. Shelter E has already provided useful data on the prehistoric use of Pine Mountain, and it has the potential to yield additional data; in the opinion of the Arkansas Archeological Survey it is eligible for the National Register of Historic Places.

3CW7 SWEARINGEN FARM BLUFFS

In 1934 Wayne Henbest and his crew recorded a series of nine shelters on the west valley wall of Lee Creek. The three largest shelters were at the south end of the bluff line, and perishable artifacts were found. The fourth and fifth shelters were dug in but they

> found only two objects. Indications are of the finds that the Indians made a habit of using the small shelters at times not regular, and they are quite barren of objects that are non perishable anyway. There was moisture a plenty in most of the places (Henbest 1934:83).

In 1979 these shelters were relocated and one additional overhang (Shelter 1 South) was recorded south of the first one tested by Henbest (Figure 38). Again 1934 photographs and floor plans helped us relocate the shelters in 1979. Shelter 3, with its spring, was the key to all the other overhangs (Figures 39 and 40).

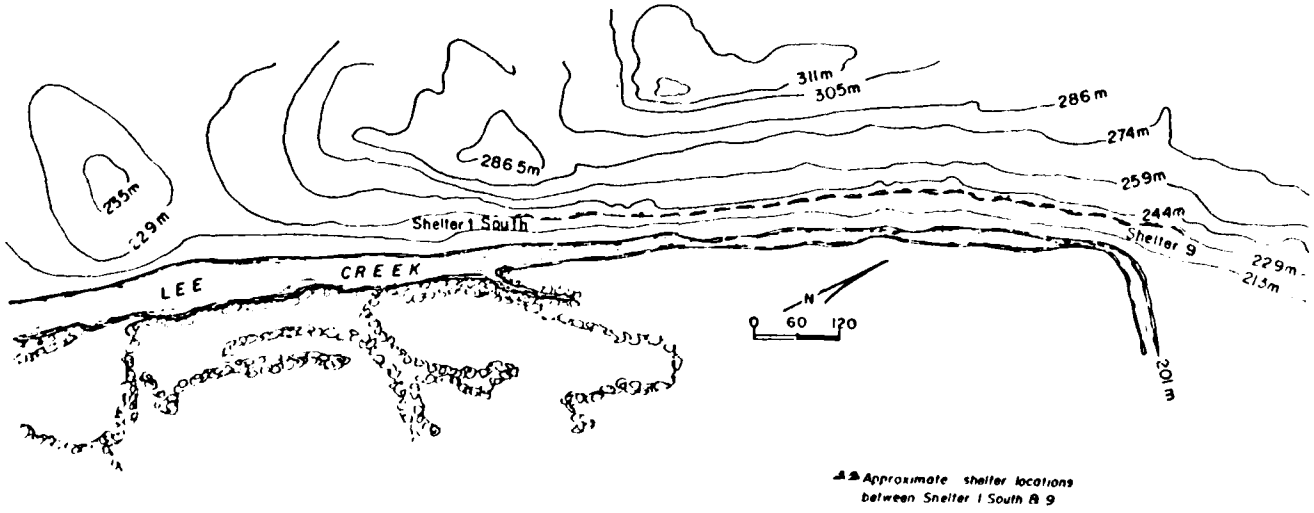


Figure 38. 3CW7 shelter distribution in 1979

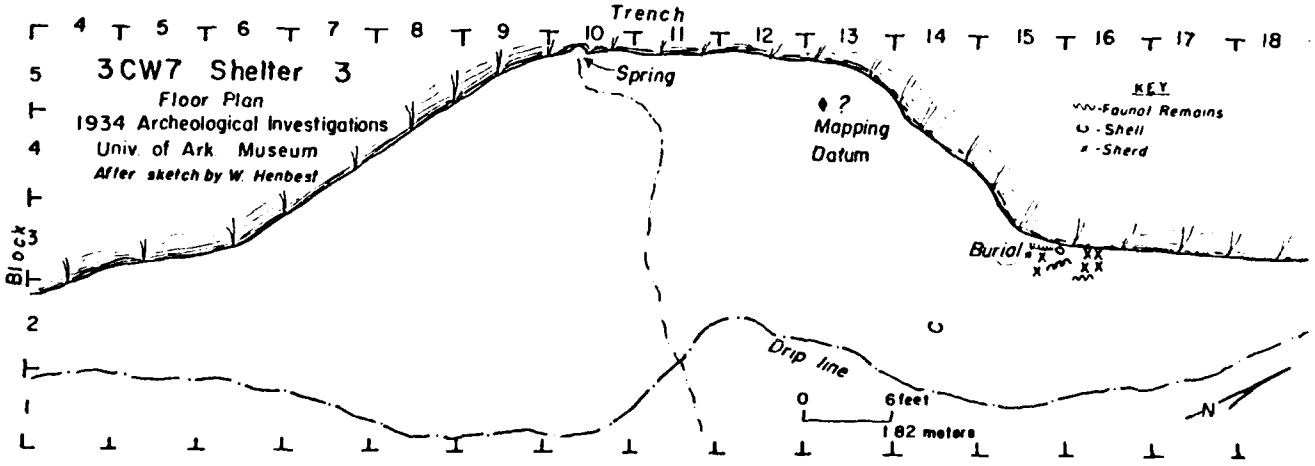


Figure 39. 3CW7 Shelter 3 1934 floor plan

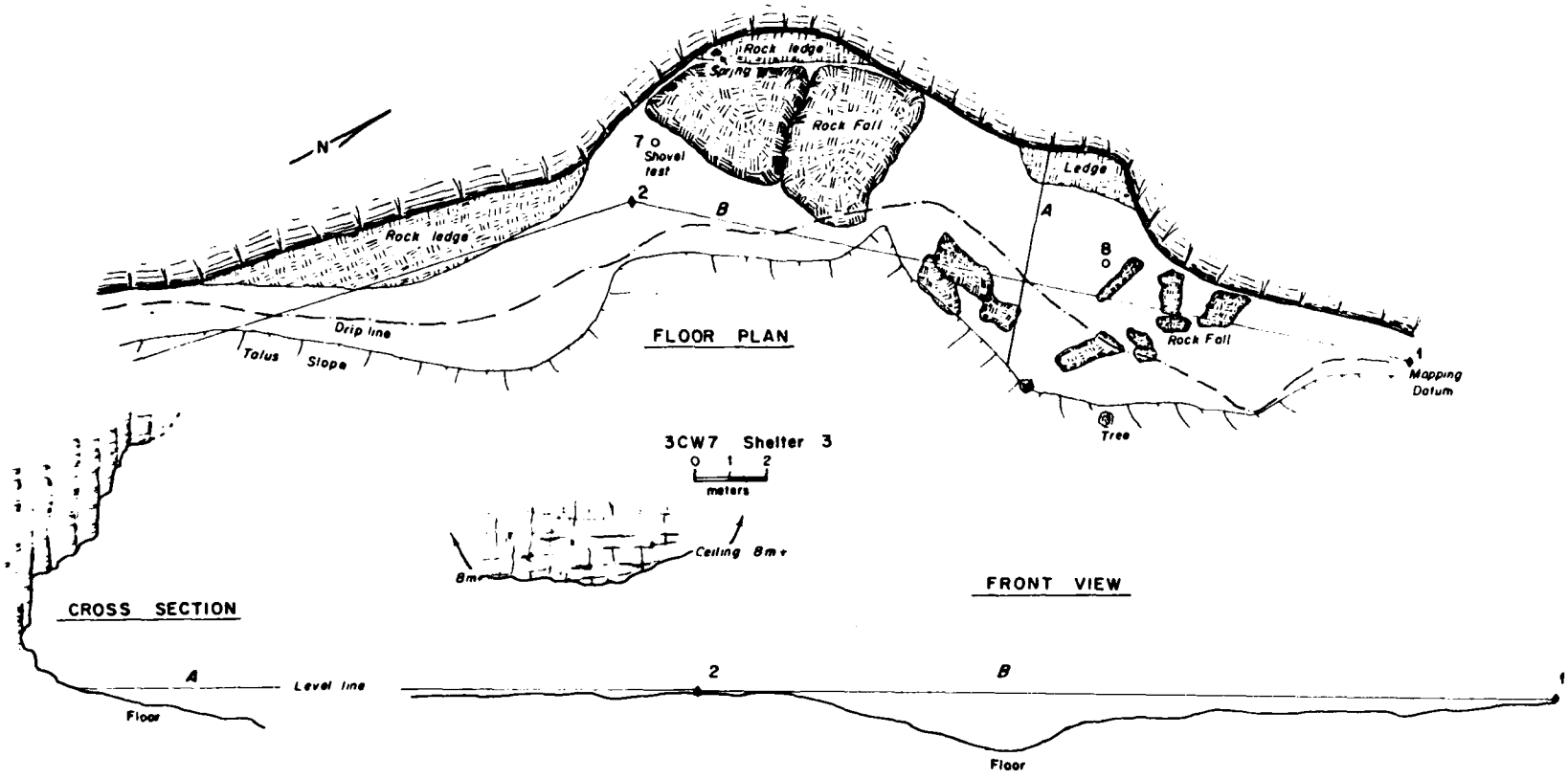


Figure 40. 3CW7 Shelter 3 1979 maps

All the shelters generally faced east and received direct sunshine until about 3:00 in the afternoon during the field investigations. The shelters overlook a steep drop down to Lee Creek from an elevation of approximately 229 m above sea level. The base of the shelters was probably higher at the southern end of the bluff line. The distance from south to north of all the shelters was in the area of 900 m, but this could be estimated only, as pacing and tape measurements were very difficult along the broken terrain. Since the climb down to the creek water was so difficult, water needs were possibly supplied by springs that came out at the same level as the shelters or above them (as at Shelters 3 and 5 respectively). The dimensions of the shelters are summarized in Table 19, and they are illustrated in Figures 39-50. Widths in Table 19 are from the outer drip lines to the rear of the shelters.

Table 19. 3CW7 shelter dimensions

Shelter	Width(m)	Length(m)	Height(m)
1 South	6.0	25.0	5.0
1	6.5	107.0	10.0
2	5.2	42.0	10.0
3	5.6	36.0	7.8
4	3.5	25.0	7.5
5	3.0	9.5	6.8
6	4.8	11.5	7.9
7	4.0	19.0	5.6
8	3.0	9.8	2.4
9	5.2	22.5	5.2

The processes of erosion that had created the shelters have continued and since 1934 have removed more of the deposits, leaving bare ledges across many of the shelters' floors.

Shovel tests were excavated in 1979 in some of the remaining soil deposits to determine whether or not any cultural remains were extant. Test 1 was in Shelter 1 South, numbers 2 to 4 were in Shelter 1, 5 and 6 in Shelter 2, tests 7 and 8 in Shelter 3, tests 9 and 10 in Shelter 4, test 11 in Shelter 5, number 12 in Shelter 6, tests 13 and 14 in Shelter 7, number 15 in Shelter 8, and tests 16 and 17 in Shelter 9.

Small fragments of bone, shell, charcoal, plant fiber, and seeds were found in shovel test 5 in Shelter 2. Test 6 in Shelter 2 also produced a few pieces of bone, shell, and a seed. Some bone and shell were found in shovel test 8 in Shelter 3. Unfortunately, no definite cultural material accompanied these finds, and it was difficult to ascertain whether they had been deposited through human action or natural means, except that the shell might have been carried up to the shelters. Shelter 9 was the only shelter that produced definite evidence of cultural occupation in 1979 (see below). In this shelter the two shovel tests were expanded into 1 x ½ m trenches (test units 1 and 2, Figure 49).

Figure 41. 3CW7 Shelter 1 South looking north

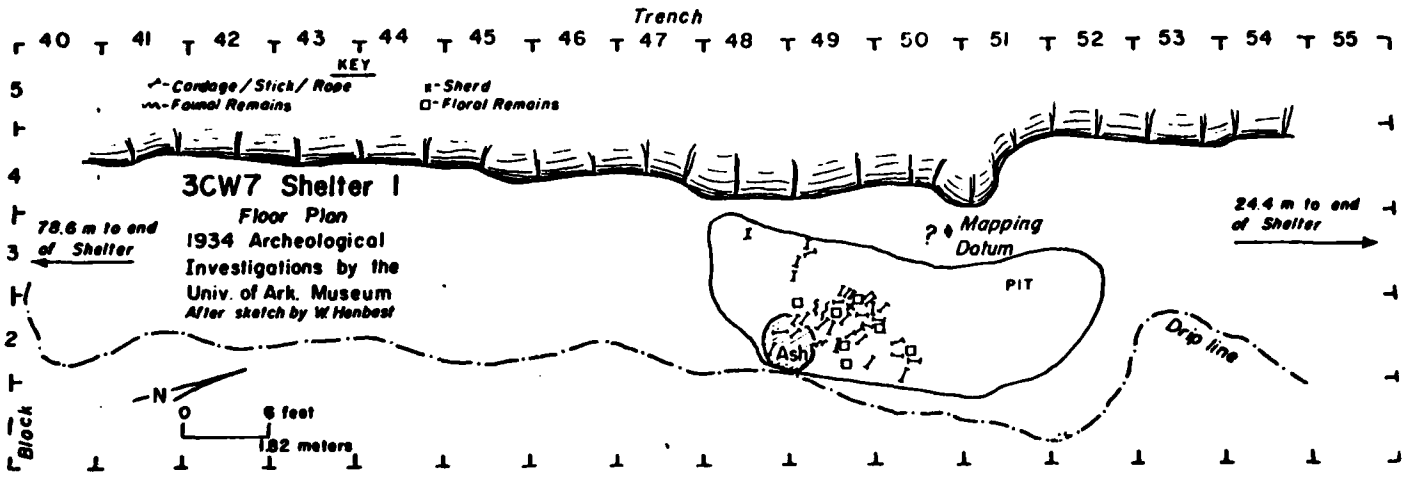


Figure 42. 3CW7 Shelter 1 1934 floor plan

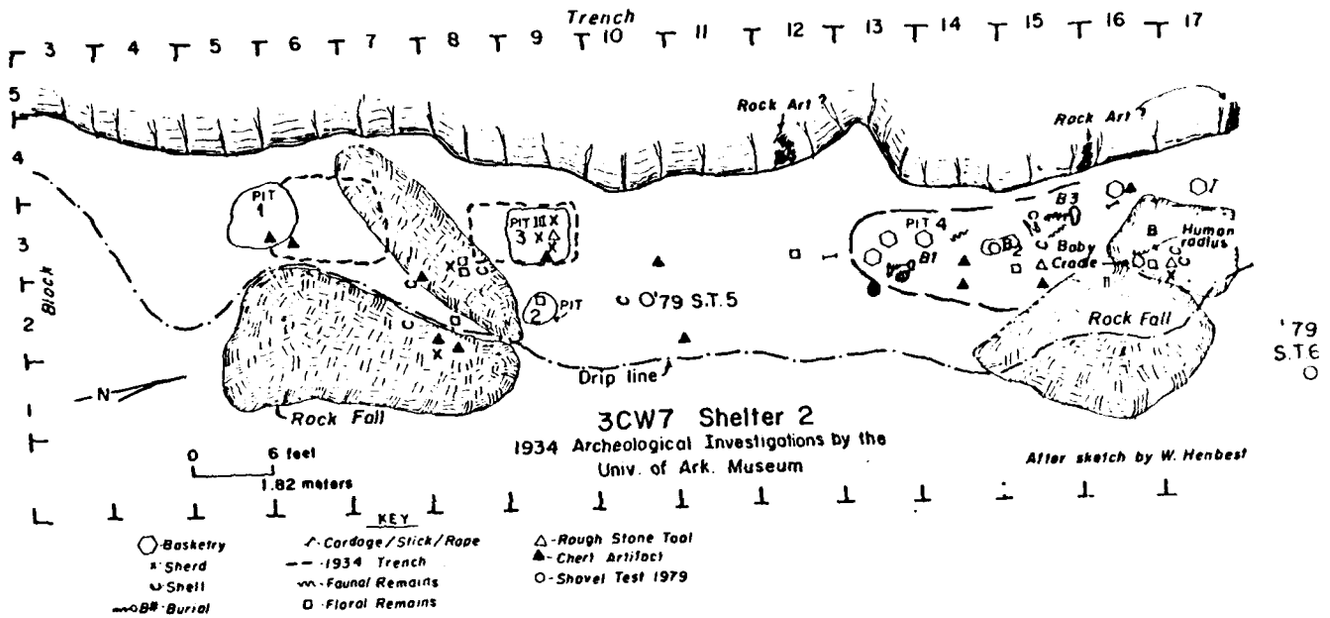


Figure 43. 3CW7 Shelter 2 1934 floor plan

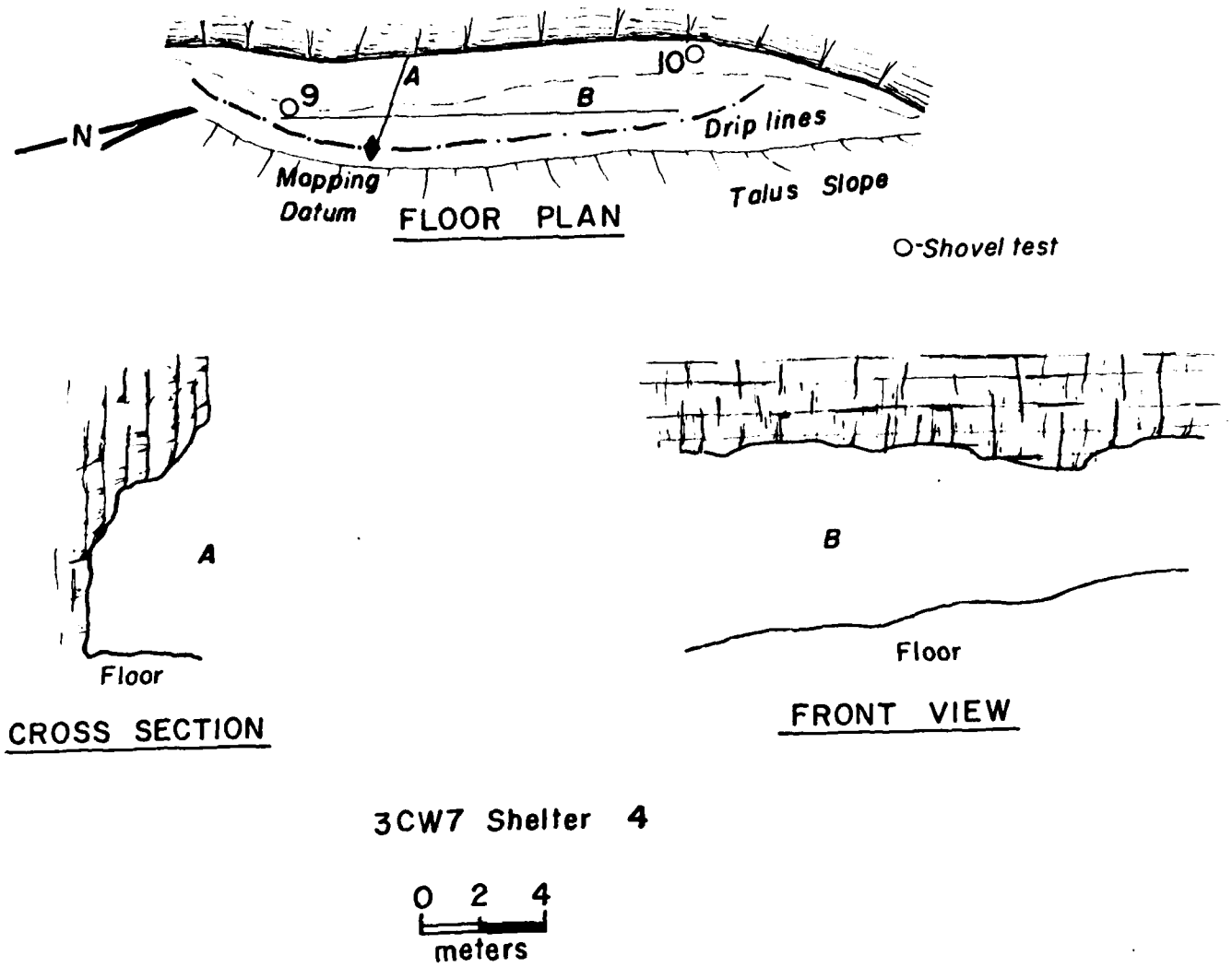


Figure 44. 3CW7 Shelter 4 maps

FLOOR PLAN

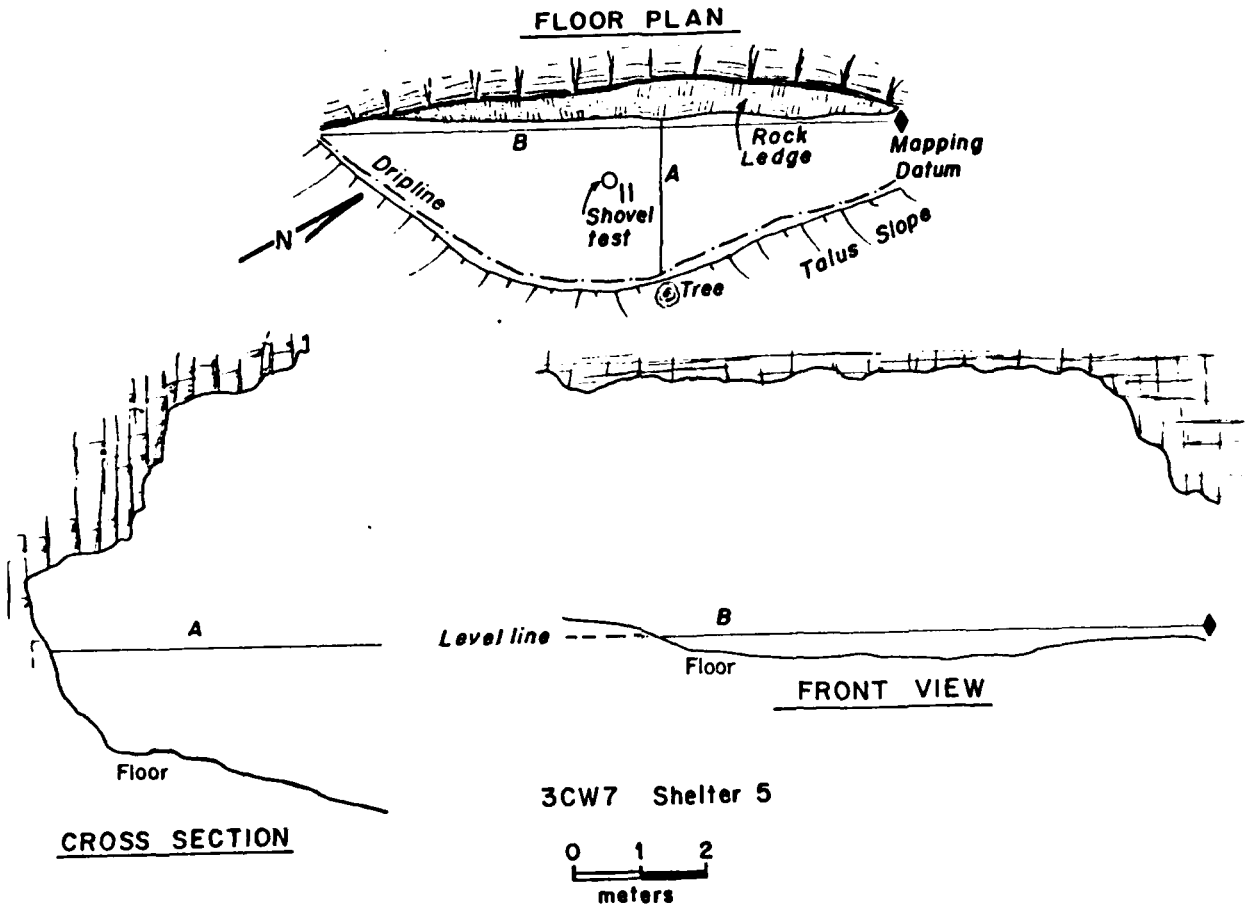


Figure 45. 3CW7 Shelter 5 maps

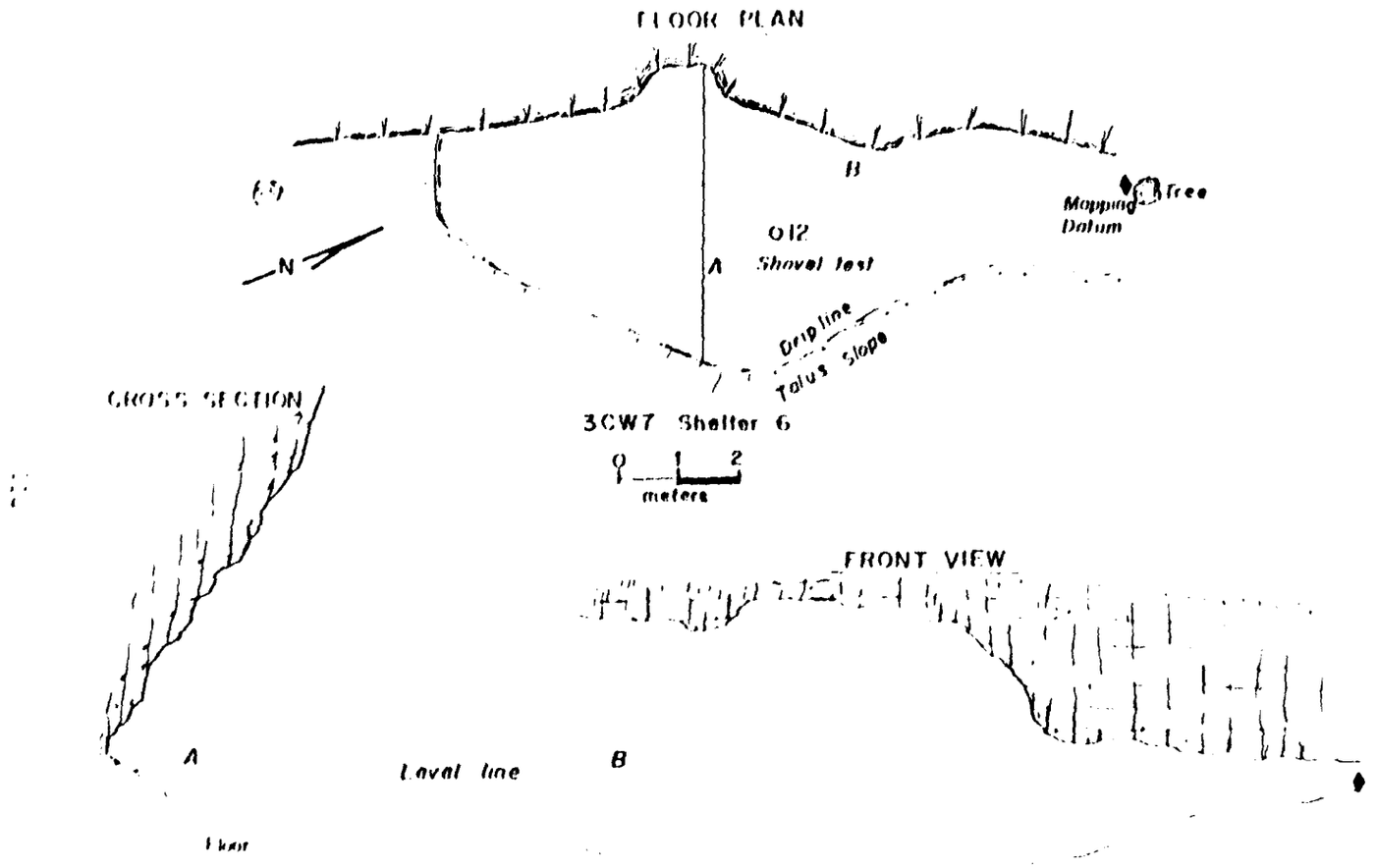


Figure 46. 3CW7 Shelter 6 maps.

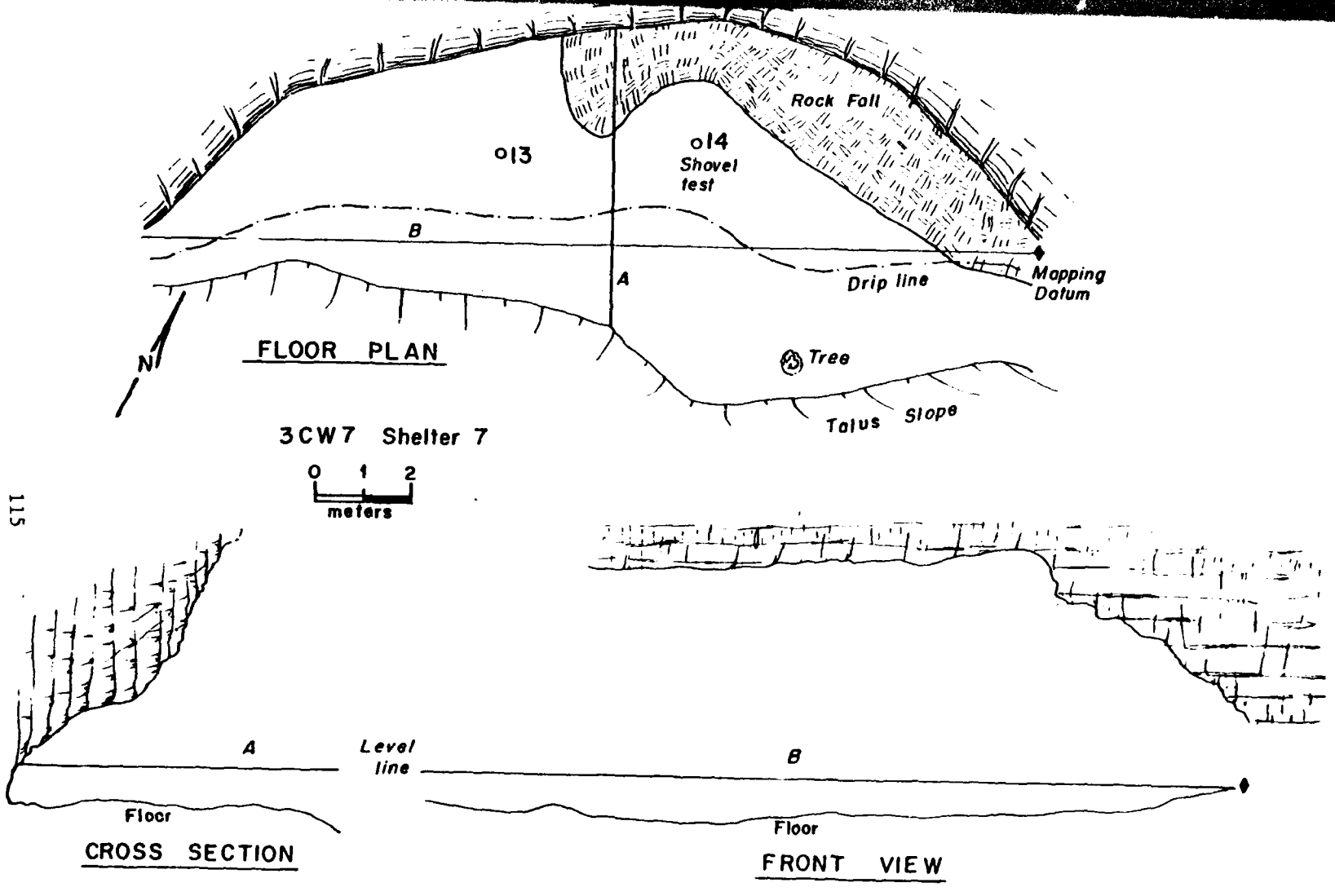


Figure 47. 3CW7 Shelter 7 maps

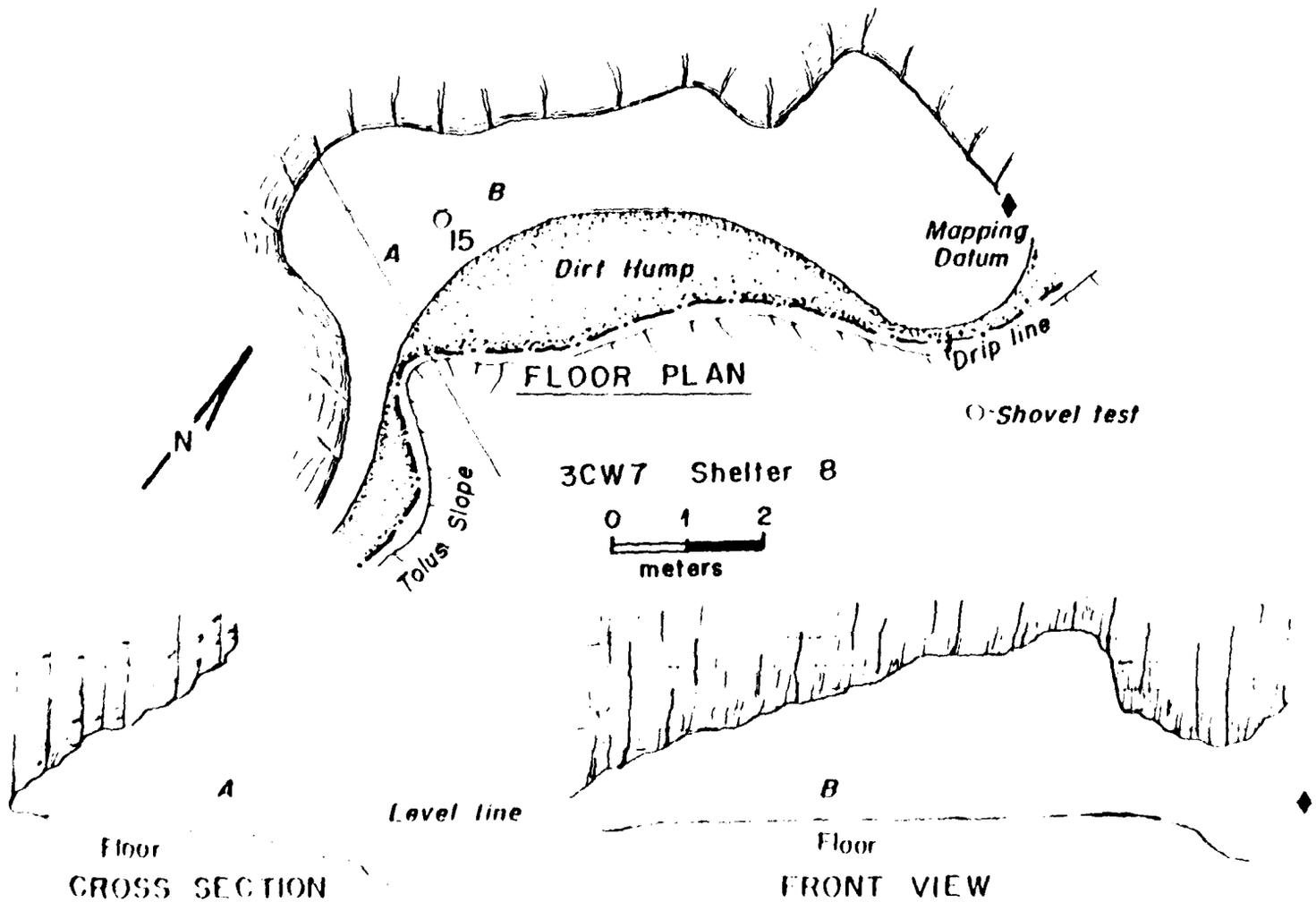


Figure 48. 3CW7 Shelter 8 maps.

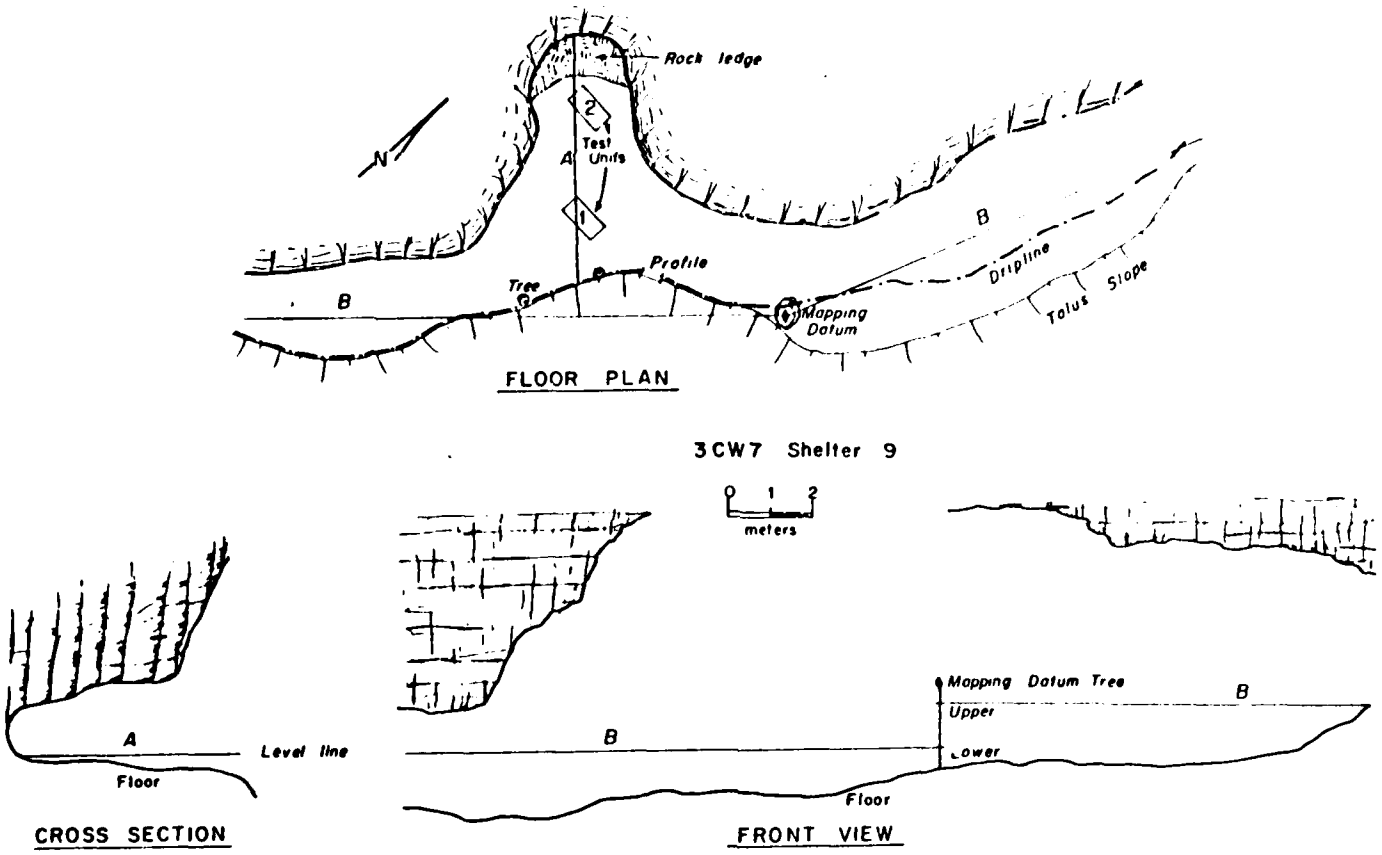


Figure 49. 3CW7 Shelter 9 maps

Figure 50. 3CW7 Shelter 9 looking north (crew member at entrance near test unit 1)

Stratigraphy

The deepest shovel test in the shelters was 67 cm deep, but maximum depth was generally less than that due to the test hitting bedrock or rock falls. In dry deposits, in particular (Shelters 1 and 2), there was a great deal of weathered shale and rock dust in the shovel tests. In areas where some soil had built up the lower levels of the tests, starting at depths of between 18 and 50 cm, there was a yellow brown or ochre matrix, which probably had accumulated from dirt and rock washed down from the top of the bluffs to the shelter floors. The Soil Conservation Service maps classified the soil in these bluffs as part of the shallow Nella-Enders Association, which is unsuitable for agriculture.

Test units 1 and 2 in Shelter 9, and a soil profile dug on the bank edge of that shelter showed a two-zone stratigraphy (Figures 51-53). In test unit 1 the first zone averaged about 58 cm in depth. This zone was a reddish yellow (7.5YR 6/6) color and appeared to contain much clay, including some rocks. Although cultural material was found in zone 1, nothing was recovered in zone 2 which was a light brown (7.5YR 6/4) clay that was very hard. The bank profile produced a similar two zone profile, although zone 1 was shallower (only 30 cm deep), possibly due to greater erosion from the action of the drip line (Figure 53)

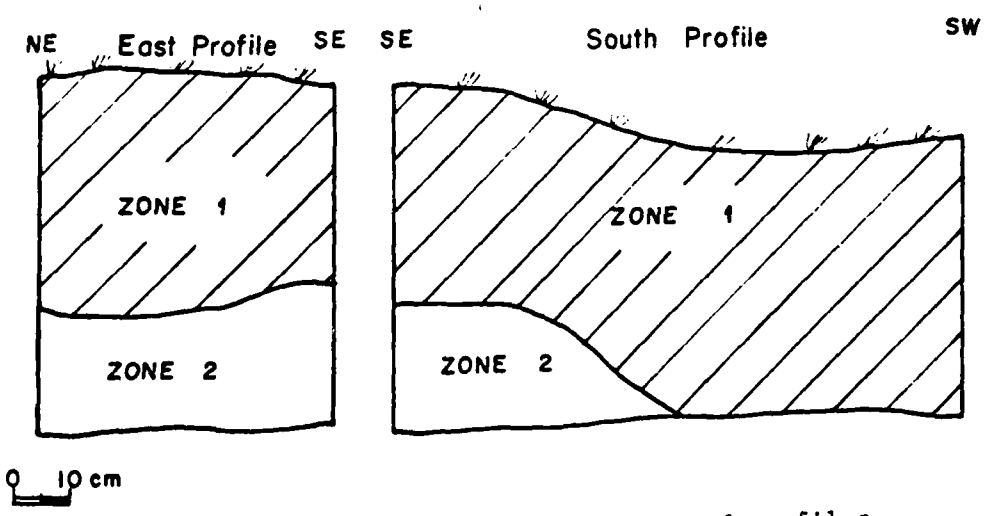


Figure 51. 3CW7 Shelter 9 test unit 1 profiles

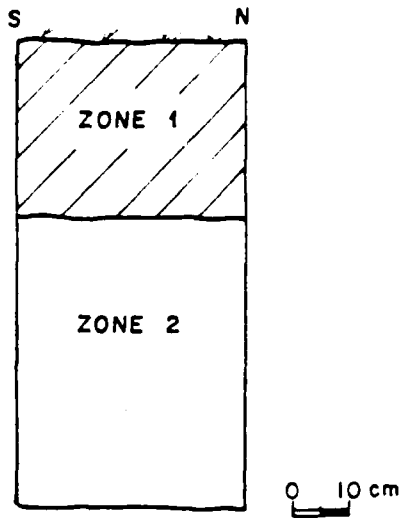


Figure 52. 3CW7 Shelter 9 bank profile

Test unit 2, in the rear of the shelter produced a much shallower two zone profile. Zone 1 was a dark brown (10YR 3/3) silty clay level with much rock in it. Again only zone 1 contained cultural remains. Zone 2 had a brown (10YR 5/3) soil that had more clay than the upper zone.

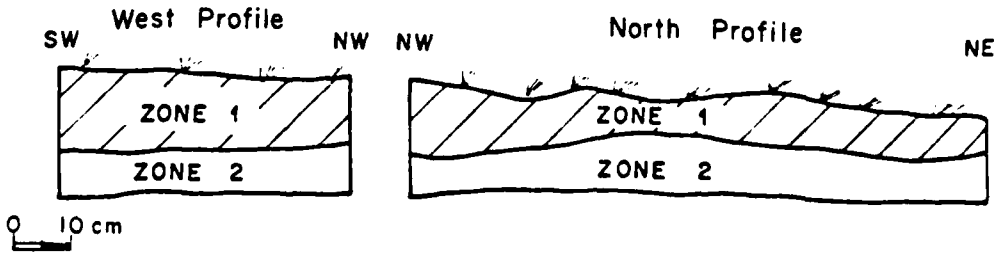


Figure 53. 3CW7 Shelter 9 test unit 2 profiles

Soil samples were taken from zone 1 in both test units 1 and 2. Levels of calcium were high in the alkaline soils. Test unit 2, which was closer to the wall of the shelter, had a higher organic content, which was equalled in the 1979 work only in test unit 1 in 3CW6. The chemical analysis of the two soil samples is shown below.

Table 20. 3CW7 Shelter 9 soil sample analysis

Provenience	pH	Organic %O.M.	Parts per million P	K	Ca	Na	Mg	Conductivity ECx10^6
Test unit 1 zone 1	6.6	0.3	7.5	42.5	1200	90	175	56
Test unit 2 zone 1	5.9	1.2	8.5	100.0	1150	70	250	40

Artifacts

The 1979 collection. As already noted, the material recovered in the 1979 investigations in Shelters 2, 3, and 7 could not be positively linked to a defined cultural occupation. One chunk of Pitkin chert was found 25 m south of Shelter 5 along the bluff line, and all of the rest of the 1979 findings came out of Shelter 9. On the surface of Shelter 9 a biface fragment (Plate 24a) and a flake, both made of Boone chert, were found. Test unit 1, zone 1, produced 14 bone fragments (unidentified), five unmodified flakes, a flake with edge modification, and a biface fragment (Plate 24c). The modified flake and three of the unmodified flakes were made of Pitkin chert, and the rest of the lithics were made of Boone chert. In test unit 2, zone 1, there were four pieces of shell, five charcoal fragments, two flakes with edge modification (Plate 24e-f), a shell-tempered Woodward Plain body sherd (Plate 24b), and a biface fragment (Plate 24d). All three of the lithics in test unit 2 were made of Boone chert.

The 1934 collection. In Shelter 1 all artifacts collected in 1934 (Table 21) were floral remains, with the exception of one shell-tempered body sherd of Woodward Plain, some ashes, and the fore leg (humerus, radius, and ulna) of a buffalo (*Bison bison*) which still had tendons connecting the bones when they were discovered (Figure 54).

Three pieces of used or modified cane (e.g., Plate 25a,e), four cut or used sticks (e.g., Plate 25b-c) and three stakes were found (e.g., Plate 25f). One stake had blades of *Eryngium yuccifolium* tied around it with a double overhand knot (Plate 26a). There were three fiber knots and 13 sticks with fibers still knotted around them in the original inventory. In the 1980 analysis only 12 sticks with knots were found as one knot had come apart through the years. The three plain knots included two overhands

Table 21. 3CW7 Shelter 1 1934 artifact provenience summary

Trench Number	Block Number	Depth (cm)	Floral Material	Faunal Material	Ceramics Body	Other
48	2	7.6	knot			
		25.4				ashes
		30.5	corncob on cane splint			
		48.3	modified cane			
49	2	15.2	modified stick			
		17.8		buffalo leg		
		25.4 to 69.8	acorns, Jerusalem artichoke			
		25.4	stick with knot			
		30.5	stake			
			stake with knot			
			7 sticks with knots			
			corncob on cane splint			
		33	cordage			
			stick with knot			
		38.1	cane wrapped with leather?			
		40.6	2 sticks with knots			
			corncob on cane splint			
		43.2	bark on leaf bed			
		45.7	corncob on cane splint			
		48.3			1	
		50.8	knot, cordage			
		53.3	4 cordage			
		58.4	cut stick			
			knot			
		71.1	cut stick			
50	1 & 2	30.5	stake			
50	2	50.8	squash rind			
		66	modified cane			
		78.7	modified stick			
		91.4	squash or gourd			
		94	modified cane			
		109.2	stick with knot			
51	2	114.3	stick with knot			

Figure 54. 3CW7 Shelter 1 Bison bones in situ, 1934

and one double overhand tie. One of these knots was identified (Gilmore 1936b) as being an Eryngium yuccifolium blade. On nine sticks there were four overhands (Plate 27a; Plate 28a-b, d), four double overhands (Plate 27b, d; Plate 28c), and three unidentified knots in a hard unfinished fiber material, one piece of which was identified as yucca. The three other knots on sticks were tied in a 2-ply, Z-twist cordage, each element of which was S-spun prior to being plied, though they had been shredded only slightly before being worked (Plate 27c); this was cordage type "PC3-a" according to Scholtz (1975). All three of these cordage knots were tied overhand.

Another 2-ply, Z-twist cord, made of finely shredded bast fibers that had been S-spun prior to being plied, was found on 3CW7. This type of cordage was designated Category PC4 by Scholtz (Plate 29a). Among other plies were three pieces of cordage, Category PC8, which Scholtz (1975: 15) described as a 3-ply, Z-twist cord made of hard fibers; the finely shredded fibers were S-spun prior to being plied (Plate 29b-d). All three pieces of this cord were found within 2.5 cm of each other in trench 49, block 2. They were probably from a single length of cordage.

The fourth and last type of cordage found in Shelter 1 was Category BC1-a, a 3-element braided cord made of hard fibers which had not been twisted before being worked into the cord. Type BC1-a fibers had not been shredded much prior to being spun into cords (Plate 29e-f).

Two artifacts from Shelter 1 were unique. One consisted of a piece of cane wrapped at one end with what appeared to be deer skin or some other kind of hide, which had been dipped in something that had blackened the end (Plate 25d). Henbest (1934:58) described it as follows:

> This object apparently was used for painting or applying some liquid to the body or object. The head would be a good swab for holding paint or fluid, thus affording a uniform line wherever applied. The outer end appears to have worn due to use.

The other singular artifact was a thick piece of bark (probably hickory) that was found on a bed of leaves. It did not appear to have been modified.

A variety of food remains were also found in this shelter (Plate 30). Two halves of what probably is a single Jerusalem artichoke root (Helianthus tuberosus (Plate 30b) were recovered along with three black walnuts (Juglans nigra), two hickory shells (Carya sp.), one of which was still in its husk (Plate 30c), three northern red oak acorns (Quercus rubra), a red oak acorn that could not be identified as to species, one Shumard oak acorn (Quercus Shumardii), and a peach pit. This peach pit could be intrusive or the remains of a meal eaten by the 1934 field crew, but there was no way to determine how it got among the aboriginal remains. Also found were two pieces of squash rind (e.g., Plate 30a), one of which Gilmore identified as Curcurbita pepo. Four corn cobs were also found, providing additional evidence of horticultural products. All four of these cobs (Plate 26c-e; Plate 30h) had once been splinted on pieces of cane, forming a kind of corn on the stick, but there was no direct evidence that these cobs had been cooked. There was no sign of charring.

Some kinds of artifacts found in other nearby shelters, including mussel shells and lithics, were not found in the 1934 collections in Shelter 1.

The original field catalog for Shelter 2 included 12 chipped stone tools and a pair of sandstone abraders (Table 22). In 1980 only one abrader could be found in the collection, and three of the chipped stone tools, all presumed to have been bifaces, were also absent. This left one unmodified flake, six modified flakes (e.g., Plate 31d-h), and two bifaces (Plate 31b,c), all of which were made of Boone chert. Only one of these artifacts was diagnostic of any prehistoric culture, a triangular Hamilton or Madison arrowhead (Plate 31a) of late prehistoric times (Bell 1960:54; Perino 1968:52).

Of the two sandstone abraders, the larger one was absent from the collection as of 1980. This more finely worked tool, however, was sketched in Henbest's notes and there are in situ photographs from from 1934 (Figure 55).

Table 22. 3CW7 Shelter 2 1934 artifact provenience summary

Provenience	Trench Number	Block Number	Depth (cm)	Floral Material	Faunal Material	Chert Artifacts: Flake	Chert Artifacts: Mod. Flakes	Chert Artifacts: Bifaces	Ceramics: Rim	Ceramics: Body	Ceramics: Base	Clay	Mass	Groundstone Tools	Other
Shelter 2	5	3	45.7		1 modified shell										
	6	3	50.8					1*							
			58.4				1 Boone								
	7	2	30.5		1 shell										
			48.3		1 modified shell										
			50.8				1 Boone								
	8	2	25.4	seeds											
			30.5					1 Boone							
			40.6				1 Boone								
	8	3	2.5							1					
			15.2		1 modified shell										
			25.4	bean hull, blackberry stem					1						
	9	2	76.2	gourd rim											
	9	3	109.2					1*							
			127							1	1				
			130.2								1				
	10	3	63.5				1 Boone								
	10	4	45.7		1 modified shell										
	11	2	45.7				1 Boone								
	12	3	27.9	seeds/acorn											
			33	modified cane											
	13	2	30.5										1		
			63.5												material on skeleton*
	13	3	53.3	weaving											
			61	weaving											
			66										1		burial
	14	2	25.4					1*							
	14 &15	3	22.9												burial
			30.5		bone tool										
			33	weaving											
			58.4				1 Boone								
			66	weaving											
	15	2	53.3	dyed acorn											
			101.6			1 Boone								sandstone abrader	
	15	3	7												
			22.9												burial
			25.4		1 shell with paint										
	16	3 & 4	27.9	weaving				1 Boone							
	16	3	27.9	stick with string modified stick											
			38.1												human radius
			43.2	modified stick											
			66	bed of grass baby cradle											
	17	2	35.6							1					
	17	3 & 4	48.2	weaving											
			45.7	cane											
			48.2	cane splints											
			50.8		1 modified shell										
			68.5	stick with knot											
			88.9											sandstone abrader*	
			99.1		1 shell with paint										
			104.1		1 shell										
	Total					1 Boone	6 Boone	5	1	3	2	2			

*Not in collection in 1980

Figure 55. 3CW7 Shelter 2 large sandstone abrader in situ, 1934

The ceramics found in Shelter 2 included a rim, three body sherds, two basal sherds, and two lumps of unfired clay. The rim was a piece of shell-tempered Woodward Plain, while the rest of the sherds were grog-tempered Williams Plain. Even the clay lumps were grog tempered (Plate 32c-d), as if they were prepared for pottery construction, but had never been used. One of these clay lumps accompanied a burial (see below). According to Brown's terminology the Woodward Plain rim had a "thinned flat" profile, probably indicative of a bowl (Plate 32e). All of the Williams Plain ceramics could have come from the same vessel. The two base fragments (Plate 32a-b) had "stilted defined" profiles (Brown 1971), or an "expanded base" form (House 1978:47).

A variety of other tools and tool fragments were recovered in 1934. This included one bone that had a worked end, which has not been identified, as Cleland (n.d.) did not describe it in his analysis of the faunal remains. There were two sticks with knots on them as had been found in Shelter 1. There were two sticks with fibers knotted on them as had been found in Shelter 1. One of the knots was a double overhand, but the other was too fragmentary to identify. They were tied in an unmodified hard fiber that was probably yucca. Two modified sticks and a piece of cane were recovered.

Six pieces of cane weaving were found in 1934, one of which could not be found in the collection in 1980. Four of these artifacts were included in Scholtz's analysis of Ozark bluff shelter weaving (1975). One piece was Category CFWB2-a, a complicated float weave (Figure 56). It was probably made of splints peeled from the outer surface of cane. The orientation of all its elements were directed to the exterior surface. A second larger piece of CFWB2-a was identified by Scholtz in 1980 when she reexamined the collections (Plate 33). Another category of weaving, of which there was one example, was CFWB2-b (Plate 34c). The distinction between this piece and the other two just mentioned was the varying orientations of the splints, rather than their all going in one direction. Scholtz (1975:68) said that this artifact showed no evidence of its original form, and it had no rim or selvage.

Figure 56. 3CW7 Shelter 2 Type CFWB2-a weaving and cane splints in situ, 1934

Two new kinds of weaving were identified by Scholtz in the 1980 re-examination of the 1934 material. She had not previously found examples of these types in any other Ozark bluff shelter sites. This material included a new rim form, "J" (Plate 34b), and a new complicated float weave Category CFWB5 (Plate 34a), which are defined and described in Appendix 1. The provenience of this new float weave was not recorded except for its possible association with Shelter 2.

Although not made of cane, one other piece of weaving was found in Shelter 2. This was a piece of a baby cradle (Figure 57), which Dellinger had included in an article (1936:204-205). The body of the cradle was made out of stems of sunflower, Helianthus tuberosa, which were interwoven at the ends with the bark of leatherwood, Dirca palustris (Gilmore 1936a).

Figure 57. 3CW7 Shelter 2 baby cradle in situ, 1934

When discovered in 1934, the cradle was resting on a bed of grass that appeared to have been a rat nest; there was evidence of gnawing of the cradle.

Different kinds of food remains were found in Shelter 2. Three acorns were collected in 1934, including two of bur oak (Quercus macrocarpa), and one of red oak, which was so fragmented that the species could not be identified. It apparently had some kind of red dye or coloring on it. One piece of squash shell, the stem of a blackberry bush, two bean hulls (Plate 35b), pumpkin or squash and sunflower seeds (Plate 35c) were found. A corn stalk root may also have been recovered (Plate 35a).

Faunal remains described by Cleland (n.d.) included a raccoon maxilla, an opossum mandible, parts of a rabbit, (two forelegs, two mandibles, and a scapula), a turkey coracoid, a woodrat femur, two deer bones (pelvic fragment and radius), and a crayfish pincer (Plate 35d). Two vertebrae in the collection were not described by Cleland in his analysis. Nine mussel shells were also recovered (e.g., Plate 35e-f). Five of these may have been worked along the edges, and two appeared to have some kind of red (paint?) substance inside them.

The inventory of artifacts from Shelter 3 was limited to only a few remains. There was one Pitkin chert biface found in front of the shelter (Plate 36c). Within the overhang a piece of worked shell (Plate 36d), two bone artifacts (Plate 36a-b), a mano, and ceramics were recovered (Table 23). As of 1980 the mano was not in the museum collections. One bone was identified in the Henbest notes as a bear radius (Plate 36b), but Cleland did not describe the faunal material from this overhang. All but one sherd were shell-tempered and red-slipped Poteau Plain, apparently from

Table 23. 3CW7 Shelter 3 1934 provenience summary

Trench Numb r	Block Number	Depth (cm)	Faunal Material	Pitkin Chert Biface	Ceramics Rim	Ceramics Body	Ceramics Base	Other
In front of shelter		0		1				
14	2	48.3	modified shell					
15	3	45.7	bear radius					
		73.7						mano *
		76.2				1	1	
		81.3						burial
16	3	68.6	bone tool					
		73.7				1		
		76.2				30+		
		78.7				1		
		81.3			1			
Total				1	1	33+	1	

*Not in collection in 1980

one vessel. The ceramics were all body sherds except for one rim that had a "rounded" lip (Plate 36g) and a base that was Brown's "rounded undefined" type or House's "simple flat" base (Plate 36f). The vessel could have been a bowl or a large everted rim jar. Reconstruction of the vessel may be possible. The one exception among the ceramics was a shell-tempered piece of Woodward Plain. It had a coil on it which appeared to be similar to the decorative coil illustrated by Dellinger and Dickinson (1942:Plate XXVI,s) on other Ozark shelter ceramics.

The faunal remains, pottery vessel, and mano were probably all grave offerings, as they were either inside a burial feature or adjacent to it (see below). In his notes Henbest mentioned finding some objects in Shelters 4 and 5, but apparently these remains were not collected. In the notes on Shelter 2 it was stated that "18 manos [were] found in this bluff north of the first 25 feet" (Henbest 1934:67). Unfortunately, this reference does not make it clear where this material was found. As no field number was assigned, it seems as if those artifacts were not collected, or at least did not become part of the Museum collections.

Features

Shelter 1. All artifacts found in Shelter 1 appeared to have come from an irregular pit that was a maximum of 121.9 cm in depth below the surface (Figure 42). Within this pit there was a circular feature composed of ashes at a depth of 25.4 cm below the surface. The concentration of sticks with knots, stakes, and the corncobs on splints may have represented a snare of some kind. Henbest's notes describe an association of some of the stakes, sticks with knots (which he called "weaving objects") and the corncobs on splints (Plate 26c-e).

> This collection of weaving objects were found to be located under a rock slab. Most of them had bark and grass blade strings; some have a 2 ply string. [The] group was all on the same [level] practically, but a rock above some vary in depth. (Henbest 1934:60).

In the photograph and sketch he showed an upright stake surrounded by another stake tied with cord (Figure 58) and 10 of the sticks with knots (eight of which are illustrated in Plates 27 and 28), with one of the splinted corncobs (Plate 26d) nearby. Rather than weaving items it is hypothesized that this collection of artifacts may have been some kind of snare that used a corncob bait set on a trigger. Another explanation might be that there was some kind of construction in the pit used for holding the food remains stored there.

Figure 58. 3CW7 Shelter 1 snare trap? in situ, 1934

Shelter 2. Shelter 2 had the most complex features (Figure 43). On the south end of the shelter was a small circular pit (number 1) 35.6 cm deep. The only artifacts that may have been associated with this pit were two chert bifaces, neither of which could be located in 1980. A smaller pit (number 2) in trench 9, block 2, contained squash or gourd shell at a depth of 76.2 cm. Behind this small pit was a larger one (number 3) with dimensions according to Henbest's notes of 1.2 m north to south, 1.4 m east to west, and a maximum depth of 1.2 m also. He noted a small trench coming off this feature to the south; this was only 40.6 cm deep. The pit was lined with leaves and "many ashes were present" (Henbest 1934:77). The contents of this feature were all found near the bottom, between depths of 1.3 and 1.9 m below the surface. One biface not in the collection in 1980 and three sherds (two basal fragments and one body sherd of Williams Plain) were the pit contents. This pit was found in 1979 exactly as Henbest had left it (Figures 59 and 60).

The largest "pit" (number 4) was in the middle of the shelter, at the north end of Henbest's map (Figure 43). However, I could be misinterpreting his notation, and the outlines of this feature may represent his trench rather than an aboriginal one. A variety of artifacts were found within this area (see artifact provenience in Table 22), and there were at least three human interments.

The southernmost burial (34-31-4) was described by Henbest as the cremated remains of an adult (Figure 61).

Figure 59. 3CW7 Shelter 2 pit 3 looking west, 1934

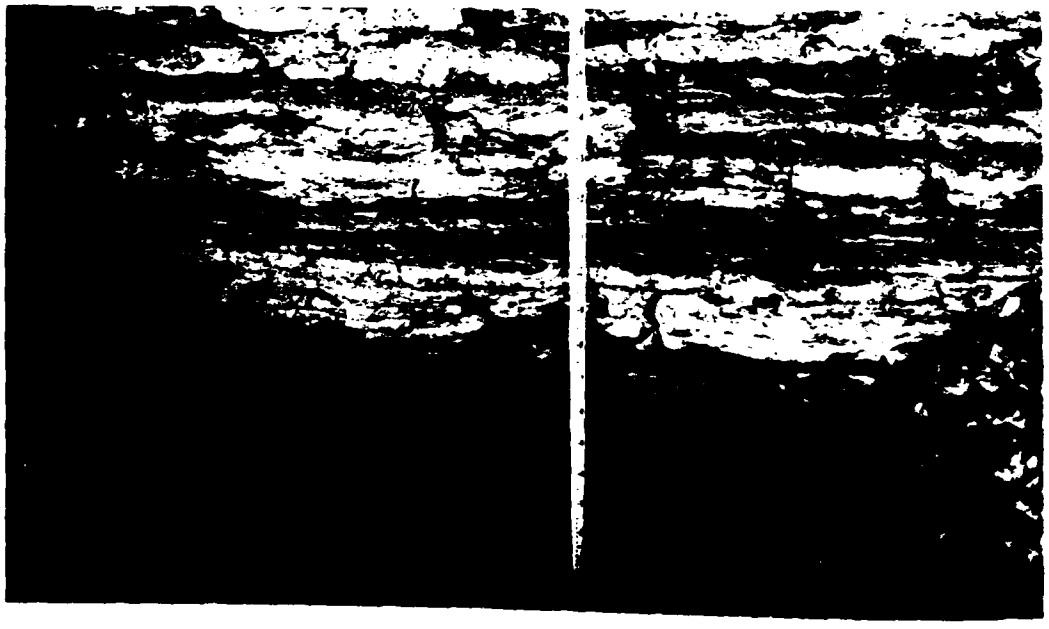


Figure 60. 3CW7 Shelter 2 pit 3 looking west, 1979

Figure 61. 3CW7 Shelter 2 burial 1 in situ, 1934 (34-31-4)

> This skeleton was very difficult to clean up as the burned bones were badly crushed up into short lengths. This was the condition of the bones which were left after cremation. Most of the bones were destroyed but there were good frontal and mandible [bones] (Henbest 1934:65).

These bones were contained within an area 1.7 m long and 73 cm wide. One of the two grog-tempered masses of pottery clay found in Shelter 2 appeared to have been present in the grave. In the 1975 study the skeletal remains were described by Jurney as follows:

> This specimen is composed of fragments of a nearly complete cranium with left facial bones. These bones suggest a slight manifestation of osteoporosis. Also a left zygomatic, not from this individual, accompanies the remains indicated above. Age and sex indeterminate (Downing et al. 1976:41).

The next burial to the north (34-31-6) had very little material to recover (Figure 62).

> This cremation was well done as there was very little left for us to clean up. The body was merely a line of crumbling bones which would brush away as easily as the ashes did. There were a lot of rocks on SW-55 and SW-53 [Henbest's field numbers for 34-31-6 and 34-31-4.] This accounted for most of the crushed leg bones. There was no evidence of a head (Henbest 1934:64).

Figure 62. 3CW7 Shelter 2 burial 2 in situ, 1934 (34-31-6)

Above the flexed leg bones the Type "J" rim of a piece of weaving was found, which appeared to be the only grave offering. Jurney's assessment of these bones was

> Nearly complete femur and humerus epiphyses. This is accompanied by uncatalogued cranial and mandible fragments. Moderate tooth wear suggests a young adult. Sex indeterminate (Downing et al. 1976:41).

The third burial found in Shelter 2 was also a flexed interment (Figure 63). One of the shells with paint on it may have been a grave offering.

> This skeleton of an old person was quite shallow and the leaves were very strangely burned or cremated. There was a few fingers and some vertebrae that were complete. There was a few ashes and ends of burned sticks in the grave. The deposit was made on a high bank, and the bank rose above the floor about 36 inches [91.4 cm] (Henbest 1934:68).

All that remained for Jurney's analysis of these bones in 1975 were highly decomposed long bone fragments and a few cranial fragments. Jurney could make no age determination, but he thought that the robust bone structures suggested that the individual was male (Downing et al. 1976:41). A human radius was found to the north of this burial, but it was not recorded as having come from any burial feature.

One set of features which had not survived was a series of three "hieroglyphics" that Henbest found on the wall of Shelter 2. These three red marks on the walls were indistinct as to shape or what they represented. Henbest noted that they may have been just some red paint on the rock wall. The red color resembled the red clay that had been used on pottery. The largest and most southerly of these marks stood 1.7 m above the shelter floor (Figure 43).

Figure 63. 3CW7 Shelter 2 burial 3 in situ, 1934 (34-31-14)

Shelter 3. Only one feature was found in Shelter 3, another burial. Henbest's crew found just an outline of a "dessicated body" in this feature (Figure 64).

> There was a heavy dark layer of charcoal on top of the grave, four inches [10.2 cm] above the skeleton. The line of charcoal was definite and had a thickness of three inches [7.6 cm] average (Henbest 1934:80).

The skeleton may have been flexed according to Henbest's sketch of it. The grave pit was dug into (depth of 35.6 cm) a moist shale, and apparently there were ashes which were also moist. A mano was found in the bottom of the charcoal layer, across from where the flexed knees would have been; this individual had been cremated. No further assessment of this grave was made in 1975.

Figure 64. 3CW7 Shelter 3 looking north at presumed 1934 burial location

Cultural Identification and Distribution

In Shelter 1, the only artifact that could be given a chronological assignment was the single sherd of Woodward Plain ceramics, placing the occupation in the Spiro phase time period between A.D. 1200 and 1300 or later (Brown 1971). The recovery of cultigens was also evidence that this was a post-Archaic period occupation.

The presence of both grog- and shell-tempered ceramics in Shelter 2 were evidence of at least two occupations. The shell-tempered Woodward Plain rim found in Shelter 2 was in trench 8, block 3, an area of relatively few artifacts. However, as some of the grog-tempered Williams Plain ceramics were associated with a pit, and, as one of the burials had a grog-tempered clay mass possibly associated with it, it was concluded that the major occupation in Shelter 2 was associated with those ceramics, dating somewhere between the Fourche Maline and Harlan phases, no later than A.D. 1200-1250. The Fourche Maline phase may be most likely, as the ceramic profiles suggest vessels of that phase. The triangular projectile point found in Shelter 2 could have been associated with either the earlier occupation or the later Spiro or Fort Coffee phases (Brown et al. 1978).

The available data suggested that Shelter 3 was a single component occupation, as Poteau Plain ceramics date to the Spiro phase. In Shelter 9, the recovery of a Woodward Plain sherd also indicated that the prehistoric occupation dated no earlier than the Spiro phase.

Settlement Patterns

The intensity of occupation in any of the shelters along the bluff line of 3CW7 did not appear to be heavy according to the amount and density of cultural material that was found in 1934 or 1979. Only a few flakes indicative of maintenance activities (tool retouch) were found in Shelter 9. Most of the cultural material found in the shelters in 1934 appeared to have come from prepared pits or prepared burials, indicating that the main use of these overhangs was for storage or the disposal of the dead. Nuts, seeds, and the other edible floral remains appeared to be whole; they had not been cooked. Projectile points may have been used for hunting from the vantage point of the shelters. The presence of deer was still clear in 1979, as the bluff line of the shelters could often be followed only along deer trails; many tracks and droppings showed that these large mammals visited the bluffs. Hunting may have also been represented in a snare in Shelter 1.

The foodstuffs that were cached in the shelters were quite diverse, including both wild plants and domesticated ones. Animals found only on the lowlands or just in the creek were caught and brought up to the shelters (mussels and crayfish). Of particular note was the entire haunch of bison, normally a lowland dweller, found high up the side of the bluff. Other animals such as raccoon and opossum may have been caught along the bluff line as well as on the lowland.

Other raw materials, such as cane for the basketry and the wood needed for some of the stick tools, were available along most of the bluff line. A particularly large stand of cane currently grows just north of Shelter 2, where all of the weaving was found.

No firm ideas on the seasonality of the occupation have been concluded from the available data. Even though some of the floral remains would have to have been collected during the summer or fall, the fact that the shelters were being used for storage purposes may indicate that the foodstuffs were brought up only for safekeeping after they had been collected or harvested elsewhere; the inhabitants may have never stayed longer than to take care of immediate concerns such as the food storage. Winter occupations seem unlikely, as the shelters did not receive direct sunlight beyond 3:00 p.m. and they did not provide good protection against the winter winds. The cold and dry nature of Shelters 1 and 2 did make them excellent places to store perishable materials.

Research Potential

Most of the shelters, 1 South, 1, 3, 4, 5, 6, 7, and 8 have little potential to still contain cultural remains. As Henbest concluded, most of the shelters may have been visited only occasionally, and were never occupied or used for storage because they were not dry enough. Since 1934 continued erosion had removed much of the shelter floors where Henbest's crew had searched for artifacts. Except in Shelter 2, where rock falls could still conceal cultural remains, there appeared to be no deposits left of archeological potential where the previous Museum excavations had been completed.

Shelter 9 was not investigated by Henbest's crew, and it was there that the 1979 research found the most remains. Shelter 9 could contain a fairly complete and relatively undisturbed occupation, useful for the definition of the lithic manufacturing and maintenance activities that may have been carried out along this bluff line. Small flakes were not collected by Henbest, and Shelter 9 appeared to be the one shelter at 3CW7 which could still yield such data. Also, the fact that it may be a single component Spiro phase occupation could yield additional information on Caddoan settlement systems both locally and on a broader regional scale.

Site Recommendations

Although most of the cultural deposits in 3CW7 have been excavated or eroded away, the site's ten overhangs have produced a variety of useful data, including perishable remains not normally found on most archeological sites in North America. However, as noted above, only two of the site's overhands (2 and 9) still have the potential to produce additional data which would be important to collect in order to help understand the materials collected in 1934 as well as answering other research questions. In the opinion of the Arkansas Archeological Survey Shelters 2 and 9 are eligible for the National Register of Historic Places. If the 1934 data had been published in detail (prior to the 1979 investigations), the site would probably have already been determined to be eligible, or have been placed on the register.

The site would be flooded by the construction of the Pine Mountain dam. If the site is found to be eligible for the register, mitigative action would be required. Large slabs on Shelter 2 should be moved to recover any remains still beneath them, and the complete excavation of Shelter 9 would be recommended, if a means of otherwise avoiding an adverse impact could not be found.

3CW69

Of the three shelter sites investigated in 1979, this one was the most difficult to identify, and its location is still not absolutely certain. The site location had never been plotted on a general area map, as it originally was listed as a site in Washington County. The information on its location came from Henbest (1934:95), for a site named for Kimbler Branch Bluffs, which were:

> two bluffs on the southeast side of the creek. Bluffs facing northwest, one quarter mile east of the highway between Cove City and Cedarville. They are also one quarter mile northeast of Johns house. This creek is five miles long and empties into the east side of Lee Creek. (emphasis mine)

On his floor plan map of the collection of artifacts, however, Henbest provided a conflicting description of this shelter:

> Kimbler Branch Bluffs, Cove City, Arkansas. Kimbler Creek. Northwest facing. One hundred feet south of the creek. One quarter mile northeast of Johns home. East of Cove City highway . . . Northeast facing. (emphasis mine)

The house referred to as "Johns" probably belonged to the home of J. W. Johns who had bought all of the northwest quarter of section 12, Township 11 north, Range 32 west, south of Kimbler Branch Creek from the Kimbler family on May 5, 1931 (Crawford County 1931). This house was just south of Kimbler Branch Creek, which is now called "Farm Branch" on the latest USGS map of the valley (1970). This information, found by Beverly Watkins in the Crawford County records, was a corroboration of an identification provided by Mrs. Flora Ramey Cluck (a long time resident in Lee Creek Valley) that Mr. Johns had bought the Kimbler place, and in turn sold it to Mr. Freeman, the owner as of 1979.

If Henbest's location of the site a quarter mile east of the highway and a quarter mile northeast of the Johns House was correct, then the site was located on the south side of Kimbler Branch Bluff. Unfortunately, the Corps of Engineers was still unable to obtain property access to that portion of Kimbler Branch Creek during the 1979 field season. However, there were some aspects of Henbest's descriptions that did not fit the landscape. Kimbler Branch Creek is not five miles long on current maps or on the 1901 thirty minute Winslow Ark/Okla. USGS Quadrangle that Henbest might have had available. The only creek that comes close to being five miles in length, and that joins Lee Creek from the east in the vicinity of Cove City, is Elmo Creek, to the north of the old Johns farm. The conflicting northwest and northeast facing directions given by Henbest also created doubt.

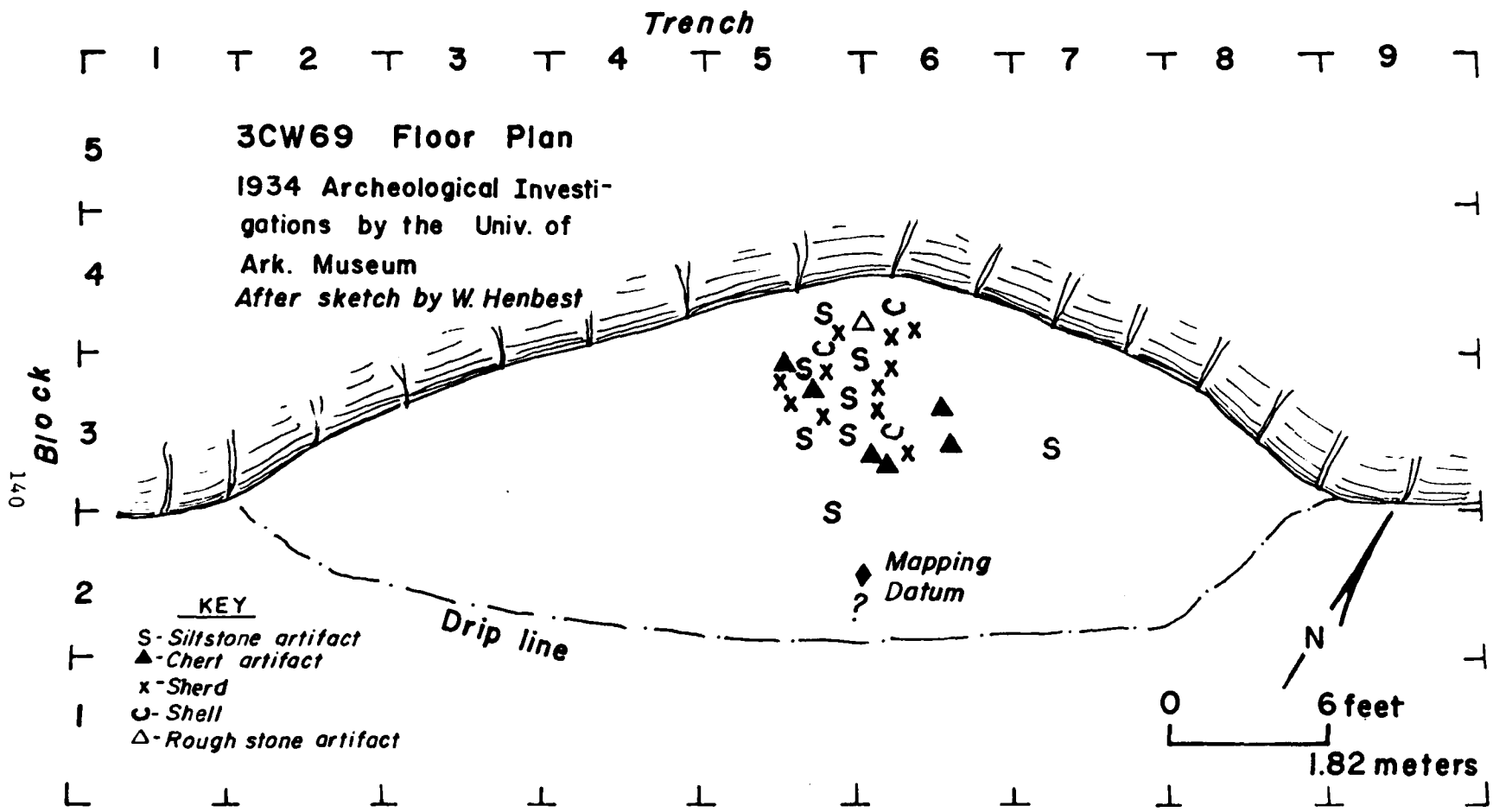


Figure 65. 3CW69 1934 floor plan

As the crew could not inspect the first potential location of the Kimbler Branch Bluff shelter, the second possibility along Elmo Creek was investigated. The current owner of this property, Johnnie Elkins, was living there in 1934, and he recalled the visit of the University of Arkansas Museum crew. He said that there were shelters along Elmo Creek and pointed our field crew upstream, on the south side of the Creek.

The only overhang found on this side of Elmo Creek, did not match the floor plan dimensions of Henbest's site (Figure 65). Three shovel tests were dug inside and without this overhang (which Raab had designated on his field maps in 1975 as "Elmore" shelter), finding no evidence of cultural occupation (Figure 66). No other overhangs fitting Henbest's description were found on either side of Elmo Creek for 800 to 900 m northeast of Elmore shelter.

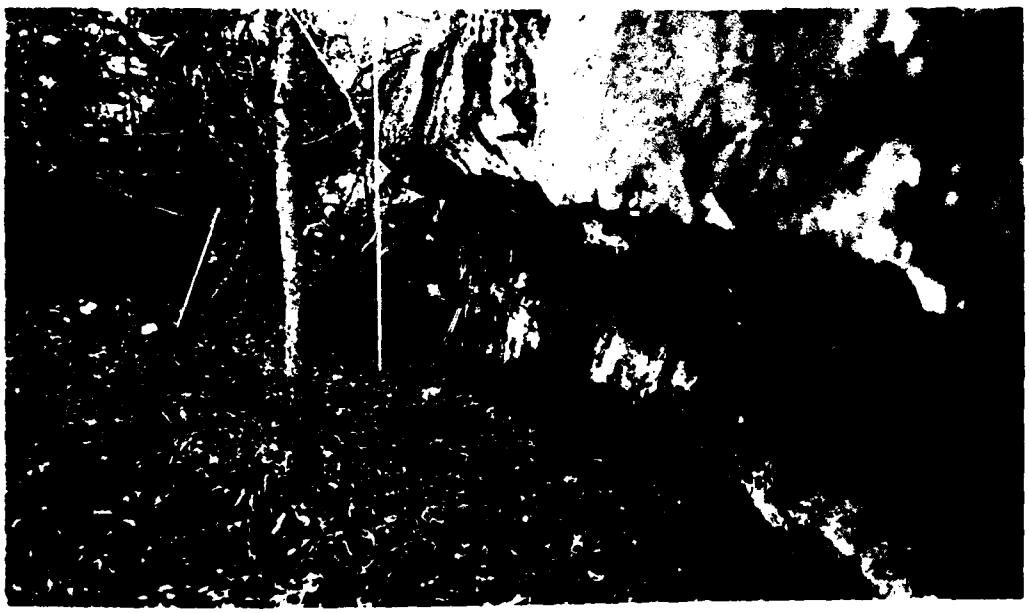


Figure 66. Elmore shelter looking northeast

On the north side of the creek, to the west of Elmore shelter, one collapsed shelter was found (Figure 67), whose overall length and width came closer to those shown on Henbest's map. The shelter had been about 30 m long, with a width of about 2.9 m and a height of 2.75 m. Its elevation is between 225.5 and 228.6 m above sea level. As the overhang had fallen in it was not possible to test this overhang to see if any cultural remains were extant. This locus was nearly three-quarters of a mile northeast of the old Johns house (farther than that described by Henbest), it faced south instead of northeast or northwest, and there was no second overhang as noted in the 1934 field notes. Based on these

Figure 67. Collapsed shelter, looking east

discrepancies this collapsed shelter was concluded not to have been 3CW69. As there were no other possible shelter locations available for inspection, the 1979 field investigations on 3CW69 were concluded after the discovery of this collapsed overhang.

Clearly some of Henbest's description of the site location was incorrect, but we were unable to decide which parts were wrong, as the first alternative location could not be investigated. Based on data in hand it was concluded that it was unlikely that the site was at the collapsed shelter we investigated, and was probably on the uninspected property. All additional discussion of the site must be based on Henbest's notes and the artifacts. No photographs were taken in 1934.

Artifacts--1934 Collection

The total artifact inventory recovered in 1934 came to 30 artifacts (Table 24). Of this material only one sherd and one chert biface were not found in the collection as of 1980. Faunal remains included part of a turtle carapace and three mussel shells, one of which had been drilled, possibly to prepare it for hafting on a wooden handle (Plate 37a). Cleland (n.d.) had not included the turtle carapace in his identification of faunal material from Crawford County sites.

Table 24. 3CW69 .1934 artifact provenience summary

Trench Number	Block Number	Depth (cm)	Faunal Remains	Mod. Flakes	Lithics Biface	Lithics Hammerstone	Ceramics Rim	Ceramics Body	Other
5	2	0			1 siltstone				
5	3	0			1 chert*				
		7.6			1 siltstone				
		10.2			1 siltstone				
		25.4	turtle shell						
		27.9		1 Boone					
		30.5			1 siltstone				
		38.1						1	
		40.6						1?*	
		43.2						1	
5	4	5.1		1 siltstone					
		10.2			1 siltstone				
		20.3			1 siltstone				
		40.6	modified shell					1	
		43.2						1	
6	3	7.6				1 Pitkin			
		20.3		1 Boone					
		35.6	shell hoe			1 Pitkin		1	
		38.1						2	
		40.6					1		
		50.8		1 Boone					
6	6	27.9	modified shell						
		45.7						2	
		50.8							sandstone abrader
7	3	15.2			1 siltstone				
Total				4	8	2	1	10	

* not in collection in 1980

Among the lithics there were four flakes, all of them with possible edge modification (e.g., Plate 38b-c), eight bifaces, two hammerstones, and an abrader. The hammerstones were both cobbles of Pitkin chert (Plate 37b-c), while the abrader was made of sandstone (Plate 36a). Three of the flakes were made of Boone chert, and one was a large hump-backed tool made of siltstone. All bifaces still in the collection were made of siltstone. One was the hafting end of a Type I tool (Plate 38c) and 3 were Type IV (Plate 39a,d-e) in Bond's terminology. One siltstone biface did not fit any of Bond's categories, although it could have been the hafting end of a Type I tool that had been reworked after it had broken.

The ceramics were diverse, including sherds representing four named types. There were three pieces of shell-tempered Woodward Plain, including two body sherds and a rim. The rim had a "direct rounded" lip (Plate 39f), and may have come from a bowl of some kind. One red-slipped body sherd might be compared with Old Town Red, and another finely made shell-tempered body sherd is similar to Mississippi Plain, var. Mound Field. Among the grog-tempered ceramics were two Williams Plain body sherds, and a body sherd similar to Baytown, var. Reed. The two remaining sherds with a plain surface had different tempers; one had a gray stone (grit) temper and the other had shell and grog temper. These sherds fall into Brown's (1971) Undesignated Plain category.

Cultural Identification and Distribution

According to the depths of the different ceramics, there may have been some stratigraphy on the site, with the lowest component at a depth of between 43.2 and 50.8 cm (grog-tempered ceramics) above which was a mixed zone of both shell- and grog-tempered ceramics between 38.1 and 40.6 cm, and a second component from the surface down to 37 cm. The lower component would have consisted of a Williams Plain sherd, one sherd comparable with Baytown, var. Reed, the two plain sherds, plus the abrader and one of the Boone modified flakes. The mixed zone contained Woodward Plain sherds, plus a piece of shell. All of the other artifacts, including the only remaining sherd (cf. Old Town Red, var. Old Town) were found no deeper than 35.6 cm, where the Old Town Red sherd was located; it was the shallowest of the ceramics recovered.

On the basis of this vertical ceramic distribution it was concluded that a brief Harlan phase occupation may have been followed by a Spiro phase or later prehistoric occupation at 3CW69. All the siltstone tools were associated with this later occupation, and they do not appear to have been from a Gober phase component, if the depth associations are correct.

Settlement Pattern

All but a few of the artifacts were concentrated in the central and rear portions of the shelter (Figure 65), which offered the most protection to the occupants. No evidence of pits or ashes was noted by Henbest. Besides the ceramics the siltstone tools were the most common artifact.

The shelter may have served as a storage area for the siltstone tools. As the shelter apparently was not a dry deposit, no perishable foodstuffs or artifacts were found as in other local shelters, if they had ever been deposited there. The presence of the hammerstones and abrader may indicate that some tool manufacture was undertaken on the site, or they could have been cached also. The lack of projectile points and the single chert biface (missing in 1980) may be negative evidence for the use of the shelter as a hunting camp.

Research Potential

Additional research can be done with the 1934 collections. Wear analysis on the siltstone tools could help define their use and determine whether they were newly stored tools, or old discarded ones. The shell might also be examined for wear patterns, especially the one that was drilled. The mussel shell and turtle carapace still have to be identified as to their genus and species. Vessel reconstruction might be possible from the one rim sherd.

The research potential of the site is complicated by the fact that we still have not been able to determine positively whether we have relocated the site or not. If the site is still extant at either of the two remaining location choices, additional research might recover small lithic remains that would determine whether the siltstone tools were being manufactured on the site. Controlled excavations might also provide additional data on the stratigraphy on the site. This is an important question, as 3CW69 is one of the few sites in the valley that has some potential stratigraphic separation of components, providing an opportunity for defining some of the culture history sequence for the Lee Creek part of the Ozarks. This site would be a relatively low elevation shelter compared to others in the valley, and a study of its local environment might provide data on its function and role in local settlement systems.

Site Recommendations

Either of the two alternative locations of the site would be flooded by construction of the Pine Mountain dam. If the project remains active, access must be obtained to the as yet uninvestigated and most likely potential site location along Kimbler Branch Creek, in order to determine if the shelter reported by Henbest was there. If it is found in that location, testing would be required to gather data on whether the site still has remains that potentially can aid in additional research.

Based on the data already found at 3CW69, it is considered to be potentially eligible for the National Register of Historic Places.

Archeological Summary

Due to the time schedule of the project and since much of the data needed for comparative purposes from earlier research in the valley has not been previously analyzed, the summary statements made here are preliminary in nature, regarding the research potential of the data. Additional analyses will be completed in the near future, providing a better understanding of the archeology of the basin and its place within a broader regional context.

CULTURE HISTORY AND SETTLEMENT SYSTEMS

The eighteen archeological sites investigated in 1979 (Table 25) represented a wide range of possible site types and cultural occupations, spanning from the early Archaic period through the twentieth century. This report represents the first published attempt at identification of the culture-historical sequence in upper Lee Creek Valley. It is stressed that these cultural identifications can only be suggested due to the few diagnostic data that were found and interpreted.

Evidence of early Archaic occupation was found only on the upper terrace at 3CW119. This may have been a small hunting camp or perhaps a larger base camp location. Late Archaic remains were found at 3CW110 and 3CW119. Undifferentiated Archaic material was present at 3CW146. Little attention has previously been paid to such open Archaic sites in the Arkansas Ozarks. Site functions, land use, and subsistence patterns are not well known, and much more research is needed on such sites, both small and large.

No definite identification of Archaic period use of the bluff shelters was found in the 1979/1980 research, including the study of the 1934 materials from 3CW6, 3CW7, and 3CW69. As noted, though, erosion could have destroyed the evidence of Archaic usage of the rock overhangs. Archaic components have been found in deeper shelters in the Ozarks, such as Rogers Cave in Missouri (Wood and McMillan 1976).

Table 25. 1979 site summary

Site Number	Subprovenience	Suggested Cultural Affiliation(s)	Suggested Site Function(s)
3CW6	Shelter C	Caddoan	storage
	Shelter E	Fourche Maline through Spiro phases	storage
3CW7	Shelter 1	Caddoan/Spiro and/or Fort Coffee phase	storage, game snare
	Shelter 2	Fourche Maline or Gober phase	storage
		Caddoan/Spiro and/or Fort Coffee phase	mortuary
	Shelter 3	Caddoan/Spiro or Fort Coffee phase	mortuary
	Shelter 9	Caddoan/Spiro or Fort Coffee phase	hunting camp
3CW69	Shelter	Harlan phase	storage
		Caddoan/Spiro or Fort Coffee phase	storage, tool maintenance
3CW110	All Loci	Euro-American-19th & 20th century	farmstead and road
	Locus 1A	Late Archaic	camp
		Fourche Maline or Gober phase	farmstead
	Locus 1B	Late Archaic	camp
	Locus 2	Late Archaic, Fourche Maline or Gober phase	camp, crop station/tool maintenance
	Locus 3	Late Archaic, Fourche Maline or Gober phase?	camp, crop station/tool maintenance
		Caddoan/Spiro or Fort Coffee phase	farmstead
	Locus 4	unidentified prehistoric	farmstead
	Locus 5	unidentified prehistoric	tool retouch
3CW117		unidentified prehistoric	tool retouch
		Euro-American 19th century	camp
3CW119	Upper terrace	Early Archaic	farmstead
		Late Archaic	hunting camp/base camp
		Fourche Maline or Gober phase	base camp
	Lower terrace	Late Archaic	farmstead
		Fourche Maline or Gober phase	base camp
		Caddoan/Spiro and/or Fort Coffee phase	farmstead
			hamlet
3CW122		Fource Maline or Gober phase and/or later	hamlet
3CW146	Locus A	Archaic	camp
	Locus B	Archaic	camp
		Euro-American 19th century	cotton gin/sawmill
3CW186		Fourche Maline/Gober phase and/or later	hamlet
		Euro-American 19th century	farmstead
3CW187	Locus 1	Fourche Maline/Gober phase and/or later	crop station/tool maintenance
	Locus 2	Fourche Maline/Gober phase and/or later	crop station/tool maintenance
3CW188		Fourche Maline/Gober phase and/or later	camp
3CW189		Fourche Maline/Gober phase and/or later	hamlet
3CW190		Fourche Maline/Gober phase and/or later	crop station/tool maintenance
3CW191		Mississippian Period?	hunting/isolated activity
3CW192		unidentified prehistoric	isolated activity
3CW193		Fourche Maline/Gober phase and/or later	farmstead
3CW194		unidentified prehistoric	hunting and/or fishing camp
3CW195		unidentified prehistoric	tool maintenance

Artifacts that could date to the Woodland period were found at a number of sites (3CW6, 3CW7, 3CW110, 3CW119, 3CW122, 3CW146, 3CW186, 3CW187, 3CW189, 3CW190, and 3CW193). The artifact complex diagnostic of these occupations includes Gary projectile points, siltstone tools and debitage, and grog-tempered ceramics. Unfortunately, all three defining categories of artifacts have yet to be found together on any one site in Lee Creek. The picture is further complicated by the fact that Gary points have a wide time span of use, and the fact that the use of the siltstone tools extended into the later prehistoric periods. These lithics and ceramics have been defined both as part of the Fourche Maline phase in Oklahoma, and the Gober phase in Arkansas. The Lee Creek valley lies between the two areas along the Arkansas River Valley where these archeological complexes have been identified. With insufficient data at present to place the Lee Creek sites in either or both phases, we can only clearly conclude that Woodland period occupations were common in the Pine Mountain area.

These Woodland peoples were making full use of the different land forms in the valley. The shelters may have been used for storage, mortuaries, and hunting camps. Terraces on the lowlands were probably used for farmsteads and hamlets, with small crop stations around fields. The lack of ceramics on lowland sites is currently attributed to the destructive effects of the acid soils and modern farming, rather than the absence of such vessels.

Some of the ceramics and arrowheads found in the 1979 and 1981 research (at 3CW6, 3CW7, 3CW110, and 3CW119) were evidence of occupations of the Harlan, Spiro, and Fort Coffee phases, which have been defined nearby in Oklahoma (Brown et al 1978). Upper Lee Creek Valley is between 20 and 25 km upstream from the nearest known ceremonial mound site, Parris Mound, in Oklahoma (Figure 1), and on a direct line it is only 30 km from Parris to Spiro. Brown et al (1978) place the Parris Mound within the Harlan phase. The nearest mound to the upper Lee Creek Valley assigned to the later Spiro phase was the Cavanaugh Mound, south of Fort Smith, Arkansas (Figure 1). Cavanaugh was only 14 km from Spiro. Based on the presence of ceramics and lithics found along the Lee Creek drainage, and the proximity of the project area to these major Caddoan ceremonial centers, it is concluded that these late prehistoric occupations in Crawford County were probably established by Caddoan peoples.

As with earlier Woodland period occupations, the Caddoan inhabitants of the valley made full use of the wide range of landforms or microenvironments; both the shelters and the lowlands played roles in their settlement system. Possible prehistoric hamlets, farmsteads, small extractive camps, and crop stations were found along the terrace lines in the lowlands. The shelters were utilized as storage areas, for mortuary purposes, and for hunting game.

Archeological evidence of historic occupation was found only at one site (3CW122) in the 1979 field research, although GLO maps also showed fields and/or houses at 3CW110 and 3CW186. A farmstead probably stood

next to the road between Van Buren and Fayetteville at 3CW122 in the second quarter of the eighteenth century; it may have been abandoned just before or during the Civil War which disrupted the lives of the farmers living in the valley. Comparisons of these three sites might reveal the criteria used by early pioneers to build their homesteads.

The occupants of the valley were greatly affected by the broader trends of the Civil War in the Trans-Mississippi South. Today's residents are connected with the world economic system through Fort Smith to the south. Late prehistoric inhabitants of Lee Creek Valley were certainly also tied into a wider social interaction sphere, including the secondary and primary mound centers noted. Some of the ceramics (cf.Mississippi Plain, var. Mound Field, and var. Coker, and Baytown Plain, var. Percy Creek) found in the shelters (3CW6) may be from vessels that were traded into the valley. Earlier occupants of the basin were identified by projectile point (Gary) and ceramic types (Williams Plain) that have a much broader distribution also, to the south in the Arkansas River Valley, and to the north, deeper in the Ozarks, along the White River and its tributaries.

The Lee Creek Valley appears to be anything but a backwards area of cultural stagnation. It may in fact be a fringe area between the deeper Ozark highlands and the Arkansas River Valley. As such the basin may provide a more sensitive laboratory for the study of cultural and environmental change over time than the major river basins where cultural occupations have been more intense, and therefore harder to seperate. Caddoan settlement systems and the environmental factors that influenced them might be easier to delineate in a small outlying region rather than at the central hearth at Spiro.

It was also noteworthy that the cultural remains found in the rock-shelters with few exceptions appeared to be from late prehistoric occupations of horticultural peoples rather than hunters and gatherers. The literature perception that the bluff dwellers were Indians who led an Archaic lifestyle did not appear to be true here on the south side of the Ozarks. The shelters reinvestigated in 1979 were not the typical shelters with deep occupation middens that have been reported in the past (such as the Tom's Brook site, 3J01, Bartlett 1963). They had narrow occupation floors, were not suited to winter habitation due to their orientation, and they did not appear to have been heavily occupied. Rather, their functions were related to activities that did not require long camping: the preparation of graves, storage pits, and perhaps small hunting camps.

Only one shelter in the Lee Creek Valley in the vicinity of the project was probably a heavily occupied overhang. This was Beaver Pond, 3CW11, which was just south of the shelters at 3CW7 and north of those at 3CW6. Not only were the occupation areas of three overhangs there larger than any of the others yet found in the valley, but they received sunlight throughout the day. There was access to the top of the

bluffs and down to the floodplain. These natural factors were most likely largely responsible for a heavy usage of the shelter, resulting in the concentration of artifacts and perishable materials that were recovered in 1934 excavations. Raab's 1975 investigations also produced more material than his crew or that of 1979 found in any of the other shelters. Unfortunately, this site has been potted heavily and any extant remains would have to be under only the largest rock falls. Due to the quantity and quality of the remains found in 1934 at 3CW11, and its apparent advantages of location, this shelter is most important for the interpretation of local settlement systems and environmental exploitation. The richness of the site was still apparent in 1979 despite the potting; on the surface the field crew found two of the few sandstone tools that have ever been recovered in the valley adjacent to a pot hole. A corn cob was also found in the rear of the shelter below a very narrow ceiling.

Other sites on the lowlands (3CW110, 3CW119, 3CW122, 3CW186, and 3CW189) were larger and had greater potential for having been the main living sites throughout prehistory. These sites were on the higher or intermediate level terraces above Lee Creek. Some had distinguishing environmental characteristics that probably accounted for the heavy occupations through time. At 3CW110 there was easy access from the lowland to the bluff heights to the north, while 3CW119 was in a varied environmental zone at the junction of Lee Creek with its largest local tributary, Elmo Creek. There appeared to be some variation in the activities that were carried out along the different terraces. On 3CW186 a number of pitted sandstone tools were found, while none have been recovered on 3CW189 in a similar terrace location.

A variety of smaller sites were found on all of the landforms investigated in 1979, on the uplands (3CW117), hilltops (3CW146), upper terraces (Loci 2,3,4, and 5 at 3CW110) and lower terraces (3CW187 and 3CW190), adjacent to abandoned sloughs, and next to Lee Creek's current channel (3CW194). These sites probably reflect many subsistence activities.

Small sites such as these are essential for the definition of subsistence settlement systems, but they have been largely ignored in past archeological research. Even recent archeological investigations in Crawford County have not given the small sites any real consideration of their research potential (Commonwealth 1979). The definition of activities at small extractive camps is important if we are to learn how populations were organized to make use of the resources provided by the natural environment, and what choices were made on that basis.

SUBSISTENCE

Impact shattered dart points, such as the Gary type, and arrowheads provided indirect evidence of hunting of wild game, while the siltstone tools provided similar data on the collection of roots and/or the cultivation of crops.

Where faunal and floral remains have been r[illegible]ered (only in the bluff shelters due to the lower acidity and moist[illegible]e content) the diversity of food remains was striking. Cultigens included corn, beans, squash and/or gourd, pumpkin, and possibly sunflower. A variety of nut bearing trees were exploited. The prehistoric inhabitants used roots and tubers such as Jerusalem artichokes, and there was also indirect evidence of the use of blackberries. Animal remains included a variety of species: racoon, opossum, rabbit, turkey, crayfish, woodrat, deer, buffalo, turtles, woodchuck, bear, fish, and mussels. These species included forest and prairie dwellers, as well as animals from the stream environment. Both plant and animal foodstuffs were being brought from their varied local niches to be stored in the shelters. All of these foods were probably available within relatively short distances of the shelters due to the diverse topography.

1975 Hypotheses

In the first Pine Mountain report Raab (1976) proposed models of local subsistence patterns dichotomized between fall-winter deer hunting and a spring-summer agricultural subsystem, including several hypotheses with suggested test implications and analytical methods.

The first hypothesis (Raab 1976:86) was based on the supposition that sites with a high relative frequency of projectile points and knives to other stone artifacts would be found on sites that were utilized for deer hunting. He stated:

> Hypothesis 1. If projectile point/knives and debitage from manufacturing and resharpening projectile points/knives reflect deer hunting, then sites utilized for deer hunting should evidence high relative proportions of these artifacts.

Evidence to support this would be found if there were sites with high relative frequencies of deer in the faunal assemblages, and/or if high frequencies of the stated lithic tool types were found in resource zones that were most favorable to deer hunting. A major problem with the development of such tool ratios, though, is the identification of sites with individual components where it could be certain that the non-diagnostic lithic debris was associated with the diagnostic hunting tools that were found. Of the sites in Lee Creek Valley, those with large enough lithic samples for producing statistically reliable tests were multicomponent. Without extensive excavations to provide data, the surface collections would not be dependable for tool ratios due to the mixing of debris from the components. Past collecting by avocationalists in the valley could also have altered the tool ratios. One cannot assume either that the different occupations had similar lifestyles, with

similar activities being carried on throughout time; the addition of horticulture to local subsistence systems should have had a long term effect on patterns of land use. Even if some single component hunting sites could be identified, the likelihood of their producing good ratios of finished hunting tools to other lithic debris would be restricted by the temporary nature of such occupations for the most part. The difficulty of solving the question was compounded at the lowland sites since no faunal remains have survived.

This problem was also based upon models of deer populations shifting from the lowlands to the uplands on a regular fall-winter basis, when mast foods and mating behavior were presumed to cause increased animal densities and therefore higher success factors in hunting. Raymond Medlock (1978) has recently questioned the validity of such models of deer exploitation. He cited Arkansas studies that showed that deer did not automatically display any preference for acorns; acorns were not a staple but rather a "bonus" food for the deer population. Also the total available deer food distribution usually showed little variation throughout the year in the diverse environment which characterizes this area of the Ozarks. Cleland concluded for the Ozark bluff shelters that "deer were not hunted seasonally but throughout the year" (1965:50).

Evidence from shelters such as 3CW6 and 3CW7 was ambiguous. A wide variety of floral and faunal remains available at different seasons were found in those shelters, but they could have been stored there for later use. The presence of both lowland and upland species in the cultural deposits indicated that the variation between elevation of the shelters and the valley floor may not have been significant enough to cause major seasonal population shifts in either the animal or human populations that selected those animals as food sources. In fact, the entire spectrum of local environments within the Lee Creek Valley, including bluff tops, the shelters on the slopes, and the different lowland terrace and streambank areas, would have been within easy walking distance for the prehistoric inhabitants, and well within the range of individual deer; the broadest part of the valley floodplain in the upper Lee Creek basin project area was under 1 km (3/4 mile). Base camps and farmsteads could have been established at the richer environmental niche intersections, from which selected extractive camps could have been reached in the space of a few hours. This appeared to be the case with the shelter at 3CW11, and the lowland terraces at 3CW110 and 3CW119. Occupation at such sites could have been multiseasonal, if not year round.

Raab's second hypothesis was based on the assumption of deer hunting reaching a seasonal peak in the late fall and early winter; supporting evidence would be the recovery of deer teeth which show growth rings indicative of mortality peaks in those seasons. Again this problem may be based on an incorrect presumption, and it probably could not be delineated as the deer remains necessary for answering the question have survived only in highly restricted locations. Raab did offer an alternative hypothesis to test if deer were a stable and predictable food resource; it was expected that kill sites would be

maximally dispersed in the area. This problem also requires the identification of hunting sites on the basis of frequencies of projectile points and knives to other lithics and the presence of deer remains on sites; again the lack of faunal remains in lowland sites would greatly hamper any progress towards answering this question.

The fourth hypothesis regarded the other side of the settlement model, the spring-summer agricultural subsystem. Lowland sites were expected to be the location of agricultural activities, and therefore they would contain digging implements which were found exclusively or mostly in these sites. Evidence of such tools was indeed found mostly on the lowland terraces in the research that has been carried out in the basin.

Both large hamlets and farmsteads, and possible crop stations were identified in the 1979 research. Although technological investigations by Bond (1977) have demonstrated the probable use of the various siltstone tools for digging activities, it has not been established that such work was exclusively for crop maintenance. These tools could have been used just as well for grubbing roots or tubers such as the Jerusalem artichoke found in 3CW7 among other food remains. The distribution of such tools was not limited to lowland sites either. Although the cache of siltstone tools at 3CW69 was in a relatively low elevation bluff shelter, at 3CW11 a hafted siltstone Type I tool was recovered from beneath a stone slab in Henbest's 1934 investigations (Figure 68). This tool was recently described by Jurney (1979:10):

> The handle is made of hickory, 30 cm long, trimmed slightly to a wedge shaped cross section, the distal 10 cm of which has been deliberately bent to the left and twisted slightly to the right. This bending was possibly accomplished by steaming the wood. A perpendicular cut mark is noticeable at the point where the bend begins. The siltstone tool fits into a rectangular socket in the distal end of the handle and was wedged into place with wooden splints. A piece of organic material, probably pitch, appears to be adhering to the handle.
>
> This distal face of the stone tool exhibits extreme smoothing and polishing on the central ridge's working edge flake scars, with the smoothing and polish gradually fading out, but extending up the entire face of the tool. The proximal face exhibits polish only near the working edge and not to the degree shown on the distal face. A light gray residue, possibly accumulations of silica, adheres to the proximal face of the tool near where the stem enters the haft socket. The angle at which the handle was bent allows the siltstone tool to strike at an effective downward angle. The most extreme wear and linear striations are present on the distal face nearest the user of the tool. This point is directly underneath the bend in the hickory handle. Based on the angle of the haft and wear patterns, the tool was used with a downward force in the right hand, angling

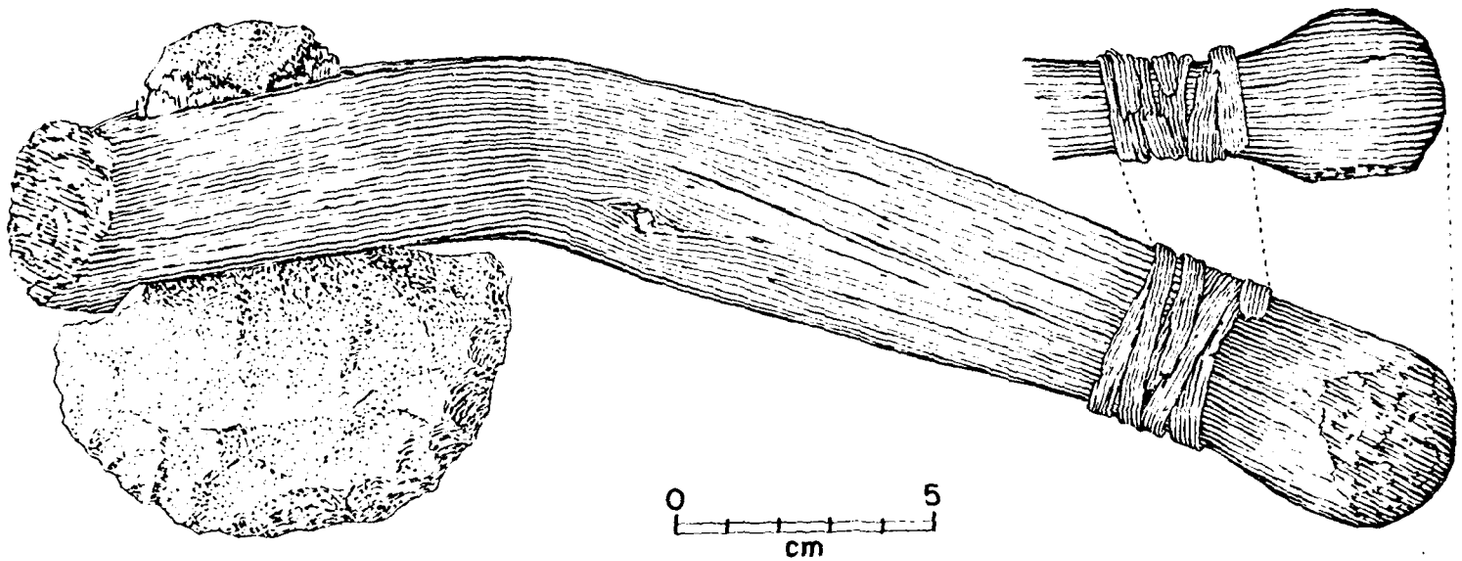


Figure 68. 3CW11 hafted Type I siltstone biface recovered in 1934

slightly to the left. Each stroke of the tool would essentially wedge the stone head tighter into the socket. This tool type, often referred to as an axe, would be more properly termed a hand mattock or grubbing tool.

Our best data on the use of these tools has thus come from a high bluff shelter site, where it would have been unlikely that any crops could have been grown. If the tool was being actively used in the immediate vicinity of the shelter, it would have to have been used on the collection of wild plants such as cane (for basketry) which does grow on the shelter levels. Alternatively it could have been cached for later use on lowland fields or for collecting floodplain wild plant materials.

Raab's fifth hypothesis concerned with the location of prehistoric fields; they were expected to be located to take advantage of optimal soil conditions of fertility, drainage, soil moisture, and vegetation cover that would have to be removed. The limited soil analysis done on the samples collected in 1979 from the lowland sites 3CW110 and 3CW119 indicated that soil chemistry (Tables 12 and 13) on the main terraces at each site were fairly similar, providing equal opportunities for horticultural use. The lumping of the soils on these terraces as well as all other lowland soils in the upper Lee Creek basin (Garner and Cox 1979) under the heading of Spadra fine sandy loam may also show the generally constant soil conditions throughout the floodplain. Crop sites might therefore have been differentiated on the basis of other factors, such as potential for flooding; all of the siltstone artifacts in the lowlands were found on terraces or rises between sloughs. Proximity to other nonagricultural resources might have affected the locations of fields if there was little differentiation in the available lowlands soils. More specific criteria of optimal soil conditions would have to be developed in order to test this hypothesis.

ARTIFACTS

This report has discussed and illustrated a wide range of archeological materials on a site specific basis, as such information has been largely unavailable in previous treatments of Ozark sites, particularly for the bluff shelters. We hope to provide data on the dimensions of the material in future reports. Ceramics were typed in comparison with three major regional sources (Brown 1971, Phillips 1970, and Dellinger and Dickinson 1942) so that other researchers may utilize the data for comparative purposes. Most of the sherds were characterized on the basis of the predominant tempering material, though very often there were mixtures of different tempers. Additional research may be undertaken to better define the paste and temper characteristics. Vessel form may possibly also be reconstructed from some of the sherds.

More research has been accomplished with the lithic materials than for other classes of artifacts, and several findings are of note. The raw material used for the lithic artifacts has been examined carefully to eliminate errors of identification. A sample of the large biface artifacts was submitted to Dr. W. Manger, University of Arkansas geologist, for identification. His conclusion that they were made out of siltstone (Mires and Duncan 1980) should direct future researchers in their discussion of such artifacts; they should be termed siltstone instead of argillite.

The siltstone was locally available in the Lee Creek Valley, as were cobbles of Boone and Pitkin chert. The lithic materials recorded in Raab (1976) and the 1979/1980 research have been compiled into a summary of the lithic remains found on 51 sites in the Lee Creek Valley from 38 different collections between 1934 and 1979 (Table 26). Raab's argillite designations were changed to siltstone. Some of the 1934 material has not yet been analyzed for lithics collected (3CW3, 3CW11, 3CW70). The predominance of local chert materials is striking. Only a few pieces of novaculite identified in Raab (1976) might be imported lithic materials. Boone chert provided 58% of all the lithic material collected, followed closely by siltstone and Pitkin chert, each about 20% of the collections. Unidentified cherts represented only 1.6% of the lithics. Sandstone tools such as abraders, anvils, and hammerstones were very infrequent: only 27 artifacts out of 4,433 lithics (.6%) were rough stone tools. Even with the addition to the list of some of the tools described by Henbest as metates (which cannot be located in the Museum collections) it would not significantly increase the sample of such artifacts. Cobbles of chert, such as those found at 3CW69, may have been used instead for hammerstones. So far as lithics were concerned, the prehistoric occupants of Lee Creek Valley had all of their needs provided by local resources.

The use of flakes as tools appeared to be relatively infrequent also: finished bifaces far outnumbered uniface scrapers or modified flakes. Debitage was the most common lithic artifact category.

Much vegetal material, the mussel shell, and some of the other faunal remains still need to be analyzed by specialists. Such analysis is especially needed on 3CW11 which has the largest and most varied collection of archeological remains, but has received the least attention compared to the potential of any of the sites recorded in 1934. Much information can be derived about resource procurement and utilization from further analysis of the 1934 collections from the Pine Mountain area. Further study of the cultigens may bear on the character of the use of domesticated plants in the Ozarks.

Among the floral remains two new kinds of basketry weave were recorded. Cordage knot types were specified and several previously identified plies were placed in their site contexts.

Table 26. Pine Mountain lithic material distribution

Collection Year	Site	Chert								
		Boone	Pitkin	Penters	Other	Novaculite	Siltstone	Sandstone	Hematite	Total
1934	3CW6	19	3							22
1979	3CW6	23	1							24
1934	3CW7	8	1							12
1979	3CW7	9	1					2	1	12
1975	*3CW11	178	74		7			2		295
1979	3CW11						35	1		2
1934	3CW69	3	2					2		14
1975	3CW110	50	14				9			98
1979	3CW110	386	149		2		31	3		718
1975	3CW111	9	3		2		180	1		20
1975	3CW112	25	1		5		4			45
1975	3CW113		1				13	1		1
1975	3CW114	1								2
1975	3CW115	1					1			2
1975	3CW116	179	22		11	2	1			287
1975	3CW117	9	5				73			19
1979	3CW117	34	3				5			51
1975	3CW118	2	3				14			5
1975	3CW119	157	32		5					243
1979	3CW119	446	63	1			49			663
1975	3CW120	22	3				146	7		26
1975	3CW121	3	5			1				24
1975	3CW122		1				6			1
1979	3CW122	14	3							51
1975	3CW123	10	15				24			33
1975	3CW124	1	4				8			5
1975	3CW125	1	1							2
1975	3CW126	113	38							166
1975	3CW127	184	45				15			296
1975	3CW128		2				67			4
1975	3CW129	3					2			3
1975	3CW130	2	2							4
1975	3CW131	8	4		2		14			34
1975	3CW132							1		1
1975	3CW133	108	29		1		16			154
1975	3CW134	1	1		3					1
1975	3CW135	3	2				1			6
1975	3CW136	6	2				1			9
1975	3CW137	4	2				2			8
1975	3CW138	2	5				3			10
1975	3CW139	61	93		12		8			174
1975	3CW140	5	1				1			7
1975	3CW141	123	14				4			141
1975	3CW142	60	25				30			115
1975	3CW143	20	4		3		1			28
1979	3CW146	15	12				1			28
1975	3CW151	54	89		19		10	1		173
1975	3CW152	4	1							5
1979	3CW186	117	26				61	6		210
1979	3CW187	16	14				17			47
1979	3CW188	18	3				5			26
1979	3CW189	22	11				22			55
1979	3CW190	10	5							15
1979	3CW191		1				1			1
1979	3CW192	1								1
1979	3CW193	9	13				5			27
1979	3CW194	4	1				1			6
1979	3CW195	6								6
Total		2589	862	1	73	3	877	27	1	4433

*1934 collections for 3CW11 have not been studied for lithic material.

Geomorphology

Excavations at some of the sites and reconnaisance tests showed that the archeological loci have potential to provide data of importance to natural scientists. Potentially stratified deposits at 3CW119 may provide information on terrace formation while the test trench at Shelter A on 3CW6 may have shown a Lee Creek flood deposit and rock fall accretion rate averaging 2.5 cm per year over the past few decades. Data on soil chemistry was also collected, showing differences between the upland and lowland soils.

Comparisons of the 1934 photographs of shelters to the conditions found in 1979 showed that erosion was very rapidly destroying the shelter floors. One major rock slide on the east side of the valley south of Cove City took place while the field investigations were underway in 1979.

Summary of Sites Located and Recommendations for Future Work

The 1979 Research

The primary management goals of Contract DACW03-79-C-0078 for the Pine Mountain Lake 1979 fieldwork were intensive survey on those unsurveyed lowlands identified in the 1975 contract report (Raab 1976), and testing to determine significance and eligibility for four lowland sites (3CW110, 3CW116, 3CW119, 3CW127) and three shelters (3CW6, 3CW7, 3CW69).

The AAS proposal in response to the Scope of Services predicted that a total of 17 new sites would be located during the 1979 fieldwork with ten being lowland sites and seven, upland. The 220 acres (89 ha) identified in Raab (1976) were subjected to intensive survey in 1979 and ten previously unrecorded lowland sites were found; 3CW186 through 3CW195, inclusive. Four new upland sites were also found; 3CW6 Shelters A, B and D and 3CW7 Shelter 1 south.

Access to sites 3CW69, 3CW116, and 3CW127 was denied by the landowners and these sites were therefore not tested, but sites 3CW6, 3CW7, 3CW110 and 3CW119 were tested. Site 3CW6 had originally been reported as two shelters from the 1934 field season. The 1979 fieldwork revealed that 3CW6 was actually five shelters located within close proximity to each other. These shelters were designated 3CW6, Shelters A through E. This designation was used in lieu of assignment of new state site numbers since the 1934 work had already assigned one site number to multiple shelters; a new number could lead to confusion in the future. Site 3CW7 was also a multiple shelter site where nine shelters had been recorded in 1934. The 1979 fieldwork located one more overhang (3CW7 Shelter 1 south).

As noted in the AAS proposal "although the original Scope of Services called for testing for significance to be carried out on newly recorded sites, time and budgetary considerations preclude such action under this proposal" (see Appendix 2). It was, however, possible to adequately test three of the newly located shelter sites: 3CW6 Shelter B, 3CW6 Shelter D

and 3CW7 Shelter 1 south. 3CW6 Shelter A was partially examined but the full testing of this site could not be completed.

Recommendations for Future Work

Major fieldwork in upper Lee Creek Valley has occurred in 1934, 1975, and 1979. Pedestrian reconnaissance has been completed for the entire area affected by the proposed lake. However, in 1975

> ...it was impossible to carry out a meaningful survey of some areas. Much of the bottomland in the project area was being used as pasture for grazing cattle and dense grass cover obscured the ground surface. Other areas, including bottomland in the Lee Creek valley and virtually all of the hillslopes at the margins of the valley, were covered by forest growth. Under these circumstances it was possible to locate sites only in areas where erosion, cattle paths, roads or other disturbances exposed the ground surface (Sierzchula 1976:47).

Even in overgrown areas where surface survey was permitted, landowners sometimes refused permission for the 1975 crew to dig shovel tests to attempt to locate sites obscured by vegetation (Raab, personal communication). Thus, there is still potential for unrecorded sites in the project area where such subsurface examination was not possible. Under the environmental conditions present no survey could unconditionally guarantee the identification of all of the cultural resources with available archeological methodology and technology. Since the sites already located in the valley probably represent the general characteristics and complexity of the archeological record there, further reconnaissance is not recommended.

Table 27 displays all known cultural resources in the project area. It indicates the type of impact, date of location, the nature of the 1975 fieldwork, the 1975 recommendations, the work proposed in the 1979 U.S. Army Corps of Engineers Scope of Services (Appendix 2), the character of the 1979 fieldwork, the 1980 recommendations contained in the previous sections of this report, and a final summary recommendation which integrates the 1975 and 1980 recommendations.

Table 28 summarizes these recommendations alone. As Table 28 indicates, no further work is recommended on 36 sites. Documentation for 16 of these sites is in this report, while the remaining 20 were discussed in Raab (1976). Based on testing thus far, 12 sites have been found to be eligible for nomination to the National Register of Historic Places in the opinion of the Arkansas Archeological Survey. Five of the sites were tested in 1979 and documentation for this determination is contained in the previous sections of this report. The other seven evaluations were based on the 1975 fieldwork (Raab 1976) in conjunction with the 1979 research. Raab (1976:95) previously had not made any specific recommendations on the National Register status

Table 27. Management summary of Pine Mountain sites (continued)

Site		Impact	Year Located	1975 Fieldwork	1975 Recommendations	COE Scope of Services	1979 Fieldwork	1980 Recommendations	Current Summary Recommendations	Notes
3CW1		None	1934	No access	Test	-	-	-	No further work	Below dam
3CW3		Direct	1934	-	-	-	-	Deep test	Document/test	Probably 3CW116, 3CW119 and/or 3CW127
3CW6										
Shelter	A	Direct	1979	No access	Test	Test	Test	Deep test	Deep test	Partial test done
	B	Direct	1979	No access	Test	Test	Test	Not eligible	No further work	
	C	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	D	Indirect	1979	No access	Test	Test	Test	Not eligible	No further work	
	E	Ind/Dir.	1934	No access	Test	Test	Test	Eligible	Mitigation needed	
3CW7										
Shelter	1S	Direct	1979	-	-	-	Test	Not eligible	No further work	
	1	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	2	Direct	1934	No access	Test	Test	Test	Eligible	Mitigation needed	
	3	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	4	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	5	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	6	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	7	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	8	Direct	1934	No access	Test	Test	Test	Not eligible	No further work	
	9	Direct	1934	No access	Test	Test	Test	Eligible	Mitigation needed	
3CW8		None	1934	-	-	-	-	No further work	No further work	Below dam
3CW11	A	Direct	1934	Test	Eligible	-	-	-	Mitigation needed	
	B	Direct	1934	Test	-	-	-	-	No further work	
	C	Direct	1934	Test	-	-	-	-	No further work	
3CW69		Direct	1934	No access	Test	Test	No access	Test	Test	No access to probable location
3CW70		Direct	1934	-	-	-	-	Document/test	Document/test	
3CW110		Direct	1975	Survey	Test	Test	Test	Eligible	Mitigation needed	
3CW111		Direct	1975	Survey	-	-	-	-	No further work	
3CW112		Direct	1975	Survey	-	-	-	Test	Test	Representative small upland site
3CW113		Direct	1975	Survey	-	-	-	-	No further work	
3CW114		Direct	1975	Survey	-	-	-	-	No further work	
3CW115		Direct	1975	Survey	-	-	-	-	No further work	
3CW116		Direct	1975	Survey	-	Test	No access	-	Test	
3CW117		Direct	1975	Survey	-	-	Survey	Document/test	Document/test	Reexamined while awaiting access to area A
3CW118		Direct	1975	Survey	-	-	-	-	No further work	
3CW119		Direct	1975	Survey	-	Test	Test	Eligible	Mitigation needed	
3CW120		Direct	1975	Survey	-	-	-	-	No further work	
3CW121		Direct	1975	Survey	-	-	-	-	No further work	
3CW122		Direct	1975	Survey	-	-	Survey	Test	Test	Reexamined, much larger
3CW123		Direct	1975	Survey	-	-	-	Test	Test	Many bifaces, in small valley
3CW124		Direct	1975	Survey	-	-	-	-	No further work	
3CW125		Direct	1975	Survey	-	-	-	-	No further work	
3CW126		Direct	1975	Survey	-	-	-	-	No further work	
3CW127		Direct	1975	Survey	Test	Test	No access	-	Test	
3CW128		Direct	1975	Survey	-	-	-	-	No further work	
3CW129		Direct	1975	Survey	-	-	-	-	No further work	

Table 27. Management summary of Pine Mountain sites (concluded)

Site	Impact	Year located	1975 Fieldwork	1975 Recommendations	COE Scope of Services	1979 Fieldwork	1980 Recommendations	Current Summary Recommendations	Notes
3CW130	Direct	1975	Survey	-	-	-	-	No further work	
3CW131	Direct	1975	Survey	-	-	-	Test	Test	Small bottomland, siltstone bifaces
3CW132	Direct	1975	Survey	-	-	-	Test	Test	Metate found, possible small habitation site
3CW133	Direct	1975	Survey	-	-	-	Test	Test	Small bottomland at fork of valley
3CW134	Direct	1975	Survey	-	-	-	-	No further work	
3CW135	Direct	1975	Survey	-	-	-	-	No further work	
3CW136	Direct	1975	Survey	-	-	-	-	No further work	
3CW137	Direct	1975	Survey	-	-	-	Test	Test	Only site in open valley
3CW138	Direct	1975	Survey	-	-	-	-	No further work	
3CW139	Indirect	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW140	Indirect	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW141	Indirect	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW142	Indirect	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW143	Indirect	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW144	Direct	1975	Document	Test	-	-	-	Document/test	
3CW145	Direct	1975	Informant	Document/architect survey/test	-	-	-	Document/architect survey/test	
3CW146	Direct	1975	Informant	Document/architect survey	-	Survey	Document/test	Document/test	Prehistoric loci found
3CW147	Direct	1975	Informant	Architect survey	-	-	-	Document/architsurvey	
3CW148	Direct	1975	Document	Architect survey/test	-	-	-	Architect survey/test	
3CW149	Direct	1975	Document	Test	-	-	-	Document/test	
3CW150	Direct	1975	Document	Test	-	-	-	Document/test	
3CW151	Direct	1975	Test	Eligible	-	-	-	Mitigation needed	
3CW152	Indirect	1975	Survey	Not eligible	-	-	-	No further work	
3CW186	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW187	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW188	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW189	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW190	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW191	Direct	1979	-	-	Reconnaissance	Survey	Not eligible	No further work	
3CW192	Direct	1979	-	-	Reconnaissance	Survey	Not eligible	No further work	
3CW193	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW194	Direct	1979	-	-	Reconnaissance	Survey	Test	Test	
3CW195	None	1979	-	-	Reconnaissance	Survey	Not eligible	No further work, below dam	
Cove City	Direct	1979	-	-	-	-	Document	Document/test	
Cemeteries									
Spencer	Direct	1975	-	-	-	-	Document	Document	
Kimbler	Direct	1975	-	-	-	-	Document	Document	
Shamrock	Direct	1975	-	-	-	-	Document	Document	
Bryant	Indirect	1975	-	-	-	-	Document	Document	
Cove City	Direct	1979	-	-	-	-	Document	Document	

Table 28. Summary status of recommendations for sites in the Pine Mountain project area.

No Further Work Required	Testing or Other Further Work	Eligible for National Register
		3CW6 Shelter E
3CW1	3CW3****	3CW7 Shelter 2
3CW6 Shelter B	3CW6 Shelter A	3CW7 Shelter 9
3CW6 Shelter C	3CW69	3CW11 Shelter A
3CW6 Shelter D	3CW70	3CW110
3CW7 Shelter 1 south	3CW112	3CW119
3CW7 Shelter 1	3CW116	3CW139
3CW7 Shelter 3	3CW117	3CW140
3CW7 Shelter 4	3CW122	3CW141
3CW7 Shelter 5	3CW123	3CW142
3CW7 Shelter 6	3CW127	3CW143
3CW7 Shelter 7	3CW131	3CW151
3CW7 Shelter 8	3CW132	
3CW8	3CW133	
3CW11 Shelter B	3CW137	
3CW11 Shelter C	3CW144	
3CW111	3CW145**	
3CW113	3CW146**	
3CW114	3CW147*	
3CW115	3CW148**	
3CW118	3CW149	
3CW120	3CW150	
3CW121	3CW186	
3CW124	3CW187	
3CW125	3CW188	
3CW126	3CW189	
3CW128	3CW190	
3CW129	3CW193	
3CW130	3CW194	
3CW134	Cove City ***	
3CW135	Bryant Cemetery****	
3CW136	Cove City Cemetery****	
3CW138	Kimbler Cemetery****	
3CW152	Shamrock Church Cemetery****	
3CW191	Spencer Cemetery****	
3CW192		
3CW195		

Key:

* = architect survey
** = architect survey/test
*** = document/architect survey/test
**** = document

of the shelters tested in 1975 (3CW11 Shelter A, 3CW139, 3CW140, 3CW141, 3CW142, 3CW143, and 3CW151) as further research was needed to place them in an areal context, but he recommended that any potential loss of their information content be mitigated

> ...by a program of excavation, laboratory study, and publication of study results....Owing to the relatively small size and shallow depth of the bluff shelter sites, it is highly recommended that these be completely excavated (Raab 1976:89).

Raab's consideration of the importance of the overhangs has been confirmed by the 1979 field study. As other overhangs were found to have suffered data loss since 1934, the data remaining in the shelters tested by Raab are invaluable for studying local and regional prehistory. Therefore, these sites are now considered to be eligible for nomination to the National Register of Historic Places.

Further work is recommended for 28 archeological sites and one historic village, to gather data on their potential eligibility for the National Register of Historic Places. Raab (1976) had recommended 12 sites for testing (3CW6, 3CW7, 3CW69, 3CW110, 3CW116, 3CW119, 3CW127, 3CW144, 3CW145, 3CW148, 3CW149, 3CW150). Of these seven sites (3CW6, 3CW7, 3CW69, 3CW110, 3CW116, 3CW119 and 3CW127) were included in the 1979 U.S. Army Corps of Engineers Scope of Services (Appendix 2). Of this group all were tested but 3CW69, 3CW116, and 3CW127 which could not be examined since access to the sites still could not be obtained from the property owners. The remaining sites recommended in 1975 were not listed in the scope and testing remains to be performed. In addition, seven of the ten lowland sites found during the 1979 reconnaissance are recommended for further testing (see above). Raab also recommended architectural surveys for 3CW146 and 3CW147, and on 3CW145 and 3CW148 to augment testing. These architectural surveys remain to be completed.

Because of the recovery of additional information during the reconnaissance portion of the 1979 fieldwork three sites originally located by Raab are now recommended for testing: 3CW117, 3CW122, and 3CW146. As noted in this report additional information on 3CW117 was obtained while the crew awaited entry to another portion of the survey area. The discovery of materials from a very early Euro-American occupation indicated the necessity for testing on this site. Site 3CW122 was resurveyed since it fell within one of the lowland survey areas. The recovery of substantial cultural material resulted in the recognition of a new prehistoric component at the site as well as an increase in the site size. While the field crew was attempting to locate the limits of 3CW119 for testing, 3CW146 was relocated and two previously unknown prehistoric components were discovered. This site is therefore recommended for testing in addition to the previously recommended documentary work.

Based on analysis of the 1934, 1975 and 1979 materials it became clear that important information was lacking in Lee Creek Valley on the full range of settlement types in the project area as well as representation of sites located in critical environmental loci. Therefore, six small

sites were selected and are recommended for further testing in order to determine if they may be eligible for nomination to the National Register because of their potential contribution to an understanding of local settlement patterning. These sites had been located in 1975 but no recommendation was made at that time. The sites selected for testing are 3CW112, 3CW123, 3CW131, 3CW132, 3CW133, and 3CW137. Site 3CW112 was selected as a representative of small open upland sites. Currently little information is available on these sites since the upland testing to date has focused on the shelters only.

The other four sites were small bottomland loci. Site 3CW123 is in the Elmo Creek drainage. Information about this site is necessary to evaluate its contribution to understanding the role and function of sites located in this restricted environmental zone. Two loci of concentrated siltstone flakes and bifaces characterized 3CW131 which was located away from Lee Creek at the base of a knoll. The potential for stratified deposits as well as the information on agricultural stations in the area indicate the need for testing at this site. A metate was found at 3CW132. Recovery of this artifact type is "often indicative of habitation sites. The probability [also] exists that this is a buried site" (Raab 1976:50). The potential of such a site for contributing to both culture historical and settlement distribution research goals of the project supports the testing recommendation. Site 3CW133, situated at the intersection of the Cove Creek and Lee Creek valleys, had also yielded a substantial quantity of material. Testing of this site is recommended since its location is unique within the project; its location at the junction of the two valleys would have provided access to the resources of both valleys for the prehistoric inhabitants. Site 3CW137 is the only known site located in the eastern portion of the open bottomlands drained by Farm Branch Creek. Based on evidence recovered during the 1975 survey it could have functioned as a farmstead and as such it should be examined through testing to determine if it may be eligible for nomination to the National Register.

Of the four new upland sites located in 1979 three were fully examined (even though this was not mandated by the contract). The fourth site, 3CW6 Shelter A, was tested by the excavation of a 4 x ½ m test trench. Excavation of this unit had to be terminated at ca. 1 m when large rock slabs were encountered. Historic (no earlier than ca. 1940) debris was found at the 1 m level. There is a possibility that sealed prehistoric materials are below this recent alluvium and therefore deep testing of this site is recommended.

Site 3CW70 was initially reported by Raab, but there was some doubt about its location in the project area at that time. Reexamination of the 1934 documents indicates that 3CW70 is within the project area. Site 3CW70 should be relocated and tested.

In addition to the 1976 recommendations for historic resources located in 1975 further work is also recommended for the historic village at Cove City (Lee Creek). The location of this village on the 1833 road between Van Buren and Fayetteville indicates the possibility of historic resources

being extant. Additional documentary research, an architectural survey, and informant interviews should precede archeological testing.

Four Euro-American cemeteries were reported by Raab for the project area. A fifth cemetery within Cove City was located during the 1979 field survey in addition to a number of isolated gravestones reported by Raab (1976). Available data on the names, relationships, and dates of birth and death should be recorded before appropriate relocation actions are instituted. This information will enhance the fieldwork and analysis conducted on the historic sites within the project area by providing population data. This is particularly important because of the lack of early records for Crawford County due to their destruction in a courthouse fire.

If the keeper of the National Register concurs with the AAS recommendations on site eligibility, mitigation is recommended for the 12 sites so designated in this report (Table 28).

As the project status has not been made final and the scope of work did not call for it, specific mitigation plans were not proposed for these sites. Mitigation of adverse effects can be accomplished in several different ways: movement of the project to avoid the site, in situ preservation, and/or recovery of the data. The preferred means of mitigation is avoidance, but if this is not feasible data recovery is a viable alternative. In situ preservation, such as through site burial with clean fill, is not recommended as too little is known about the long term effects on site chemistry and preservation of remains caused by such burial. Such action would also restrict further research on the sites.

Conclusion

Upper Lee Creek Valley can provide a sensitive laboratory for the study of broader cultural systems (particularly those of the Caddoan peoples). Studies of changes in settlement distribution in this relatively narrow basin may shed more light on those in the Arkansas River Valley to the south and the Ozarks to the north and east.

A wide variety of technological and cultural historical questions can be investigated in the valley. The siltstone tool industry is well represented for study of function and manufacturing techniques (including replication). Internal settlement patterning was apparent in surface collections on some of the sites, and additional data are likely to be extant including features such as pits and hearths, which would contain additional data on subsistence (such as seeds and small animal remains). Shell remains and fish bones could be subjected to mortality/seasonality analyses. Some of these data would bear on Raab's earlier hypotheses.

The entire Lee Creek Valley has been one of the most intensively investigated in the southern Ozarks, yet the knowledge gained in past research has merely begun to provide a series of new questions and problems that could be pursued through further research on the same sites and in the general basin area. Comparison with other areas to better define the role of local populations in broader regional traditions have only been hinted

at in the research thus far. The recovery of perishable materials from the 1934 excavations, and their safekeeping in the Museum collections has provided a broad spectrum of archeological data that is usually not available to archeologists for reconstruction of culture history, past lifeways, and testing of models of human behavior over time.

The diversity of site types and cultural occupations found in the 1979 research provide an all too rare opportunity for sampling different portions of the archeological record within a fairly restricted geographic area.

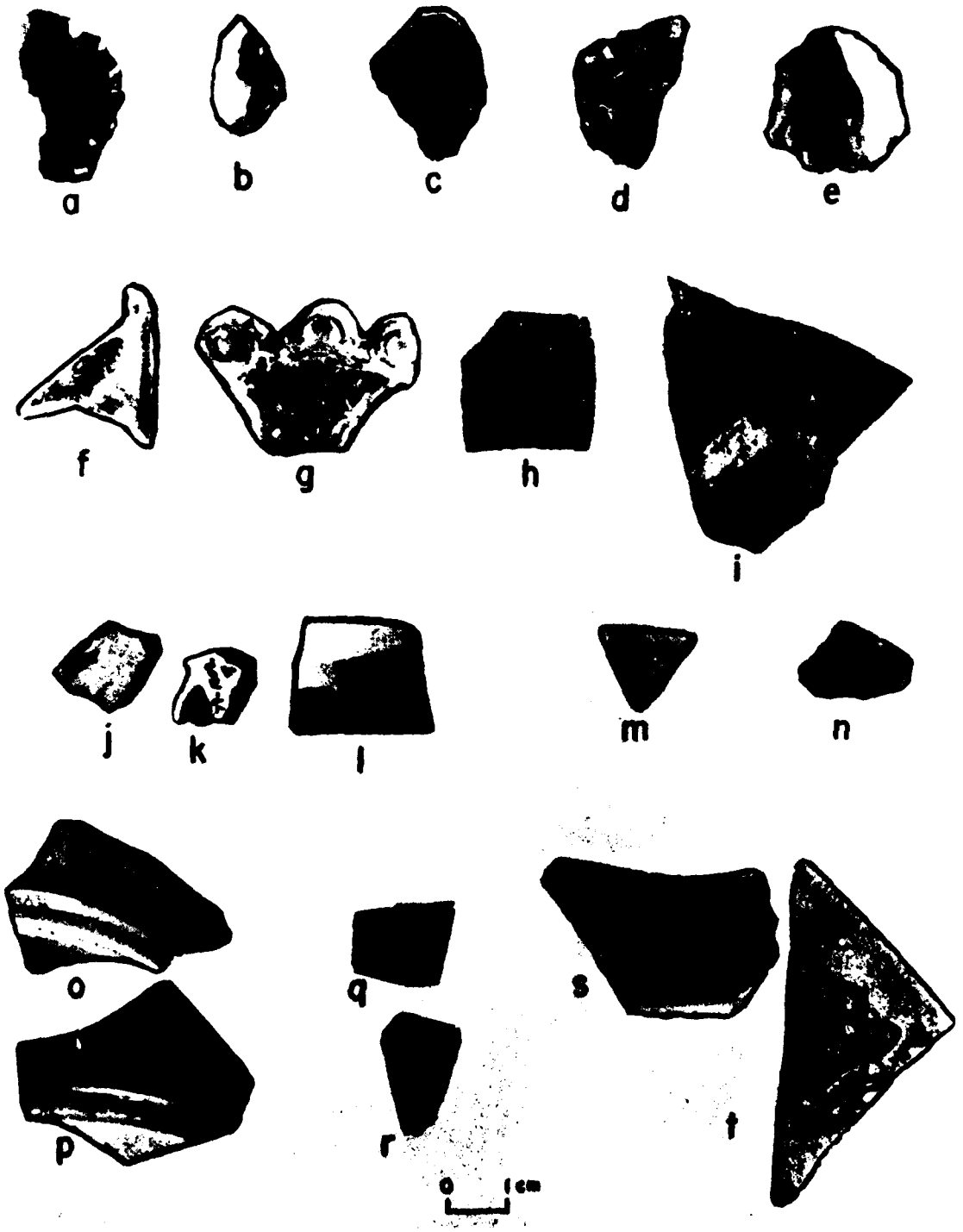


Plate 1. Site 3CW117 artifacts from 1979 survey. (a-d) bifaces, (e) modified flake, (f) panel bottle glass, (g) pressed glass, (h) salt glazed stoneware, (i) alkaline glazed stoneware, (j-l) hand-painted polychrome decorated whiteware, (m) hand-painted banded rim, (n) polychrome sponge decorated pearlware, (o-p) pearlware basal fragments, (q-r) shell-edged whiteware, (s-t) whiteware with makers' marks. Full scale.

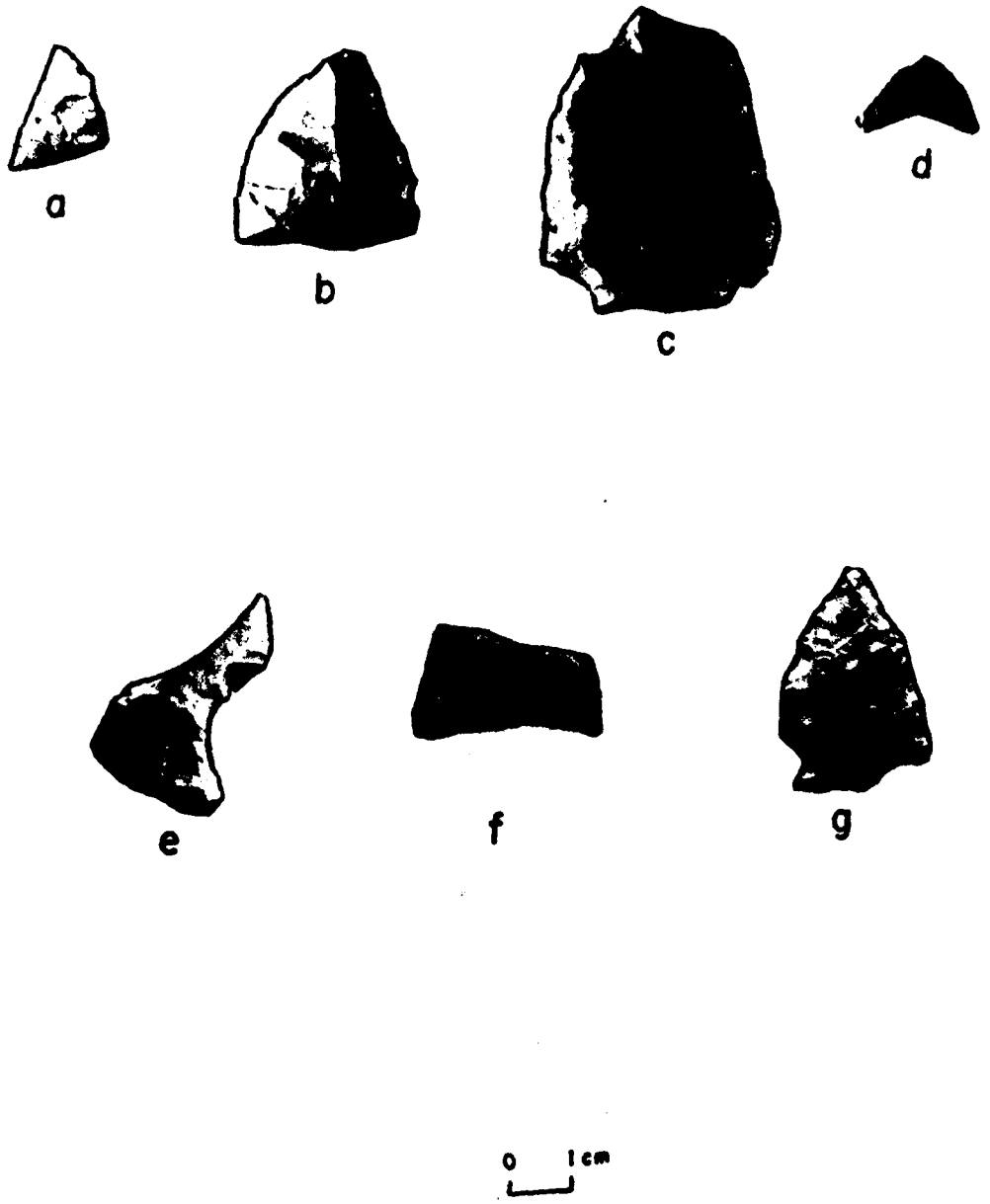


Plate 2. 3CW122 (a-d) and 3CW146 (e-g) examples of artifacts.
(a-c) biface fragments, (d) modified flake, (e) Fairland base,
(f) biface fragment, (g) White River corner notched. Full scale.

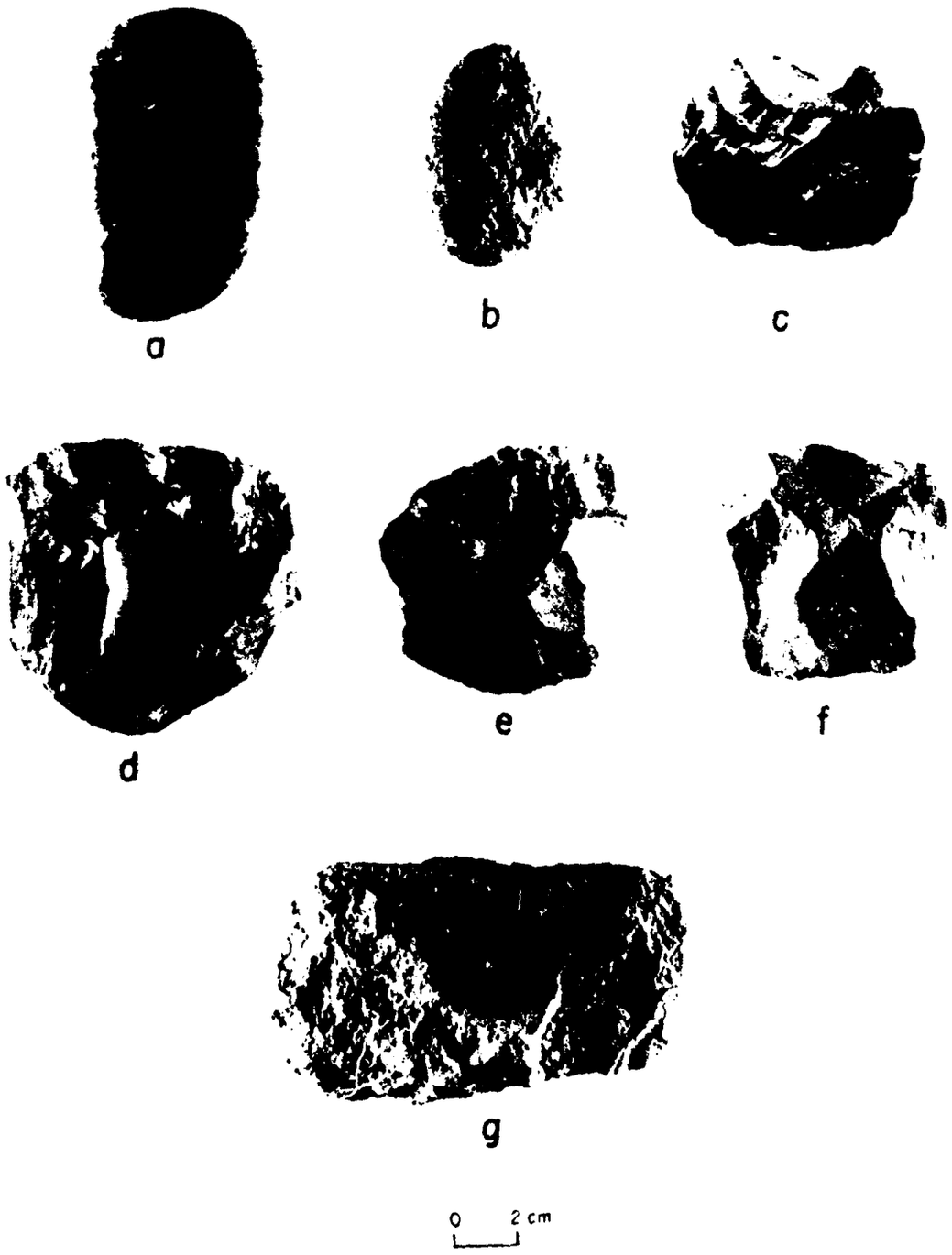


Plate 3. 3CW186 examples of artifacts. (a-b) pitted stones, (c) siltstone biface, (d-f) siltstone cores (g) Type IV siltstone biface. Half scale.

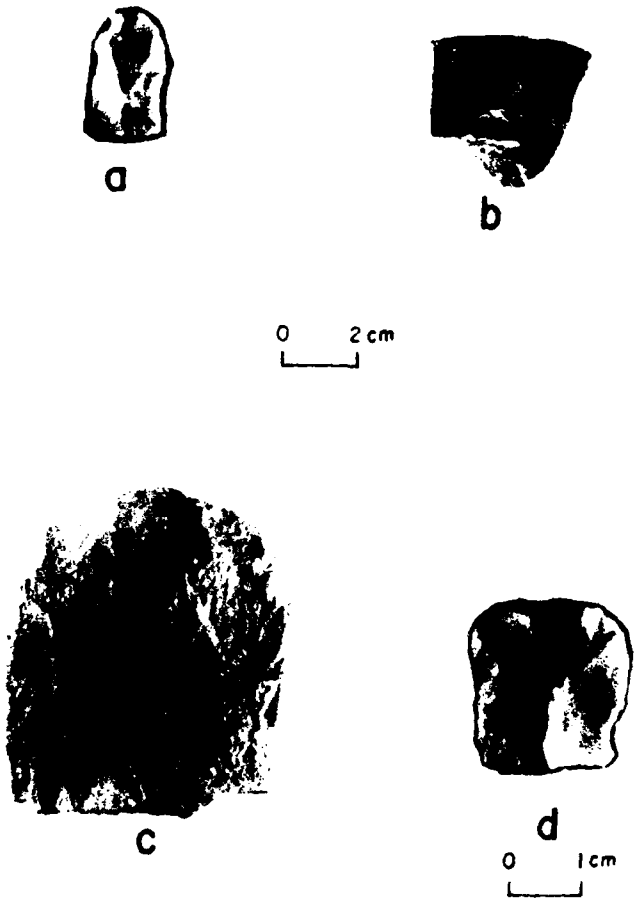


Plate 4. 3CW186 (a-b) and 3CW187 (c-d) examples of artifacts. (a,d) modified flakes, (b) Type I siltstone biface haft, (c) Type IV siltstone biface. All half scale except (d) full scale.

AD-A124 246 PINE MOUNTAIN REVISITED: AN ARCHEOLOGICAL STUDY IN THE ARKANSAS OZARKS(U) ARKANSAS ARCHEOLOGICAL SURVEY FAYETTEVILLE N L TRUBOWITZ JUN 80 RR023 3/3

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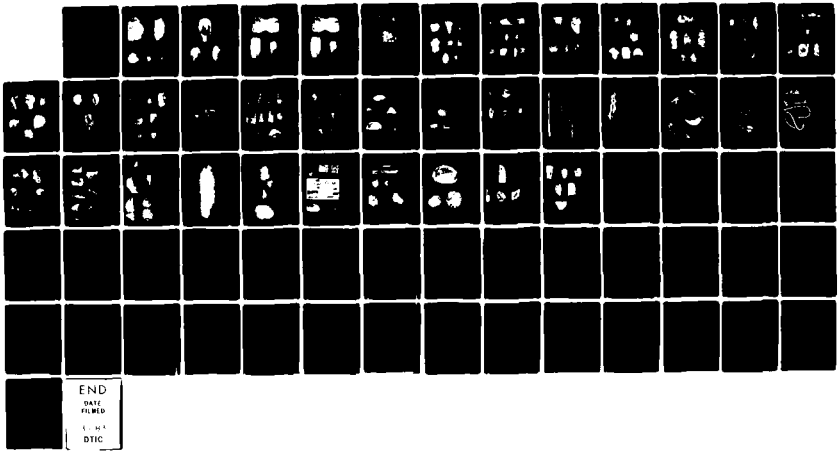

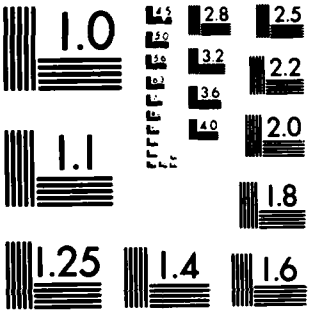

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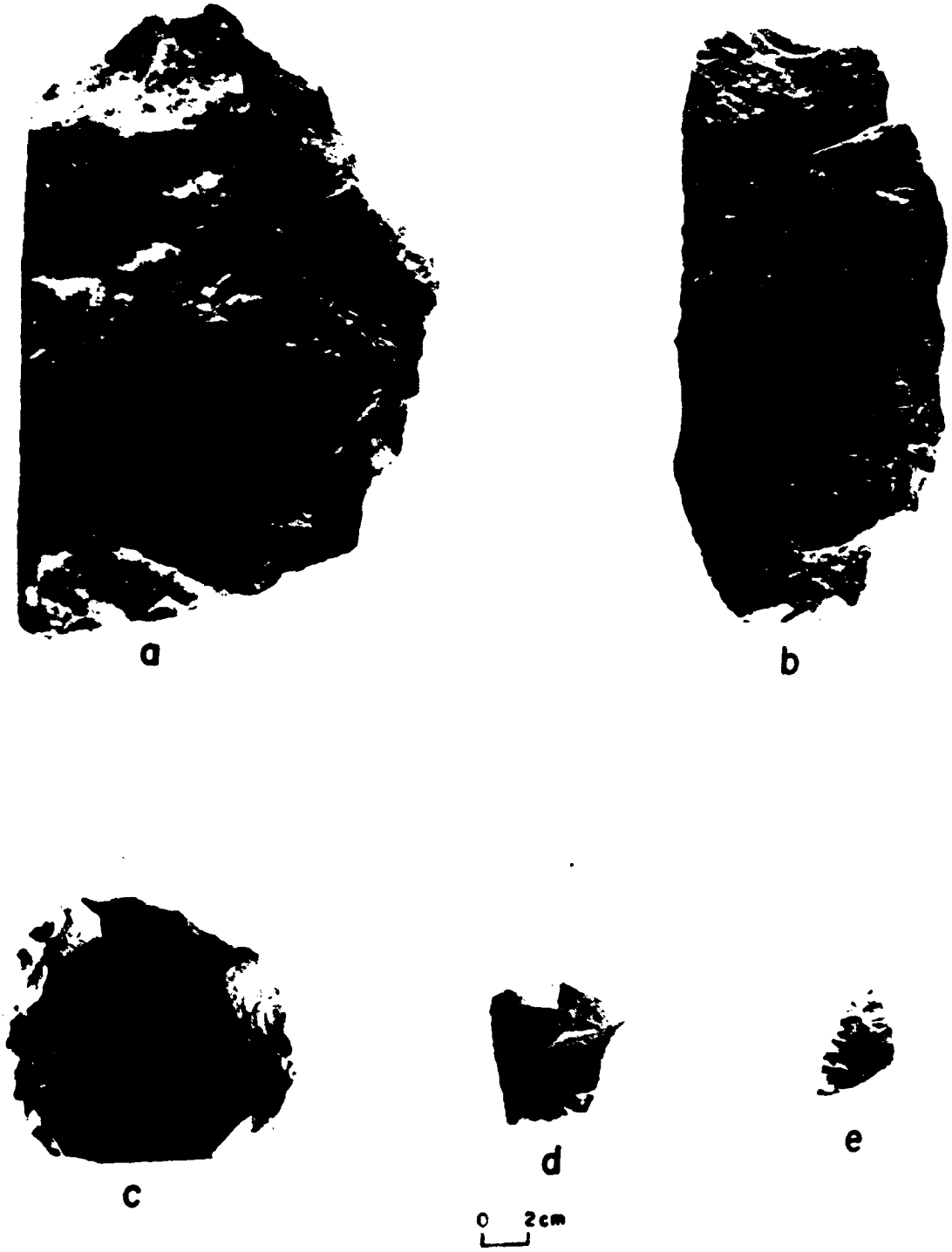

Plate 5. 3CW189 examples of artifacts. (a) worked siltstone slab, (b) Type IV siltstone biface, (c) siltstone biface, (d) modified flake, (e) biface fragment. Half scale.

Plate 6. 3CW189 siltstone tools from the Carl Cleavenger collection. (a-b) Type I bifaces, (c) Type III biface. Half scale.

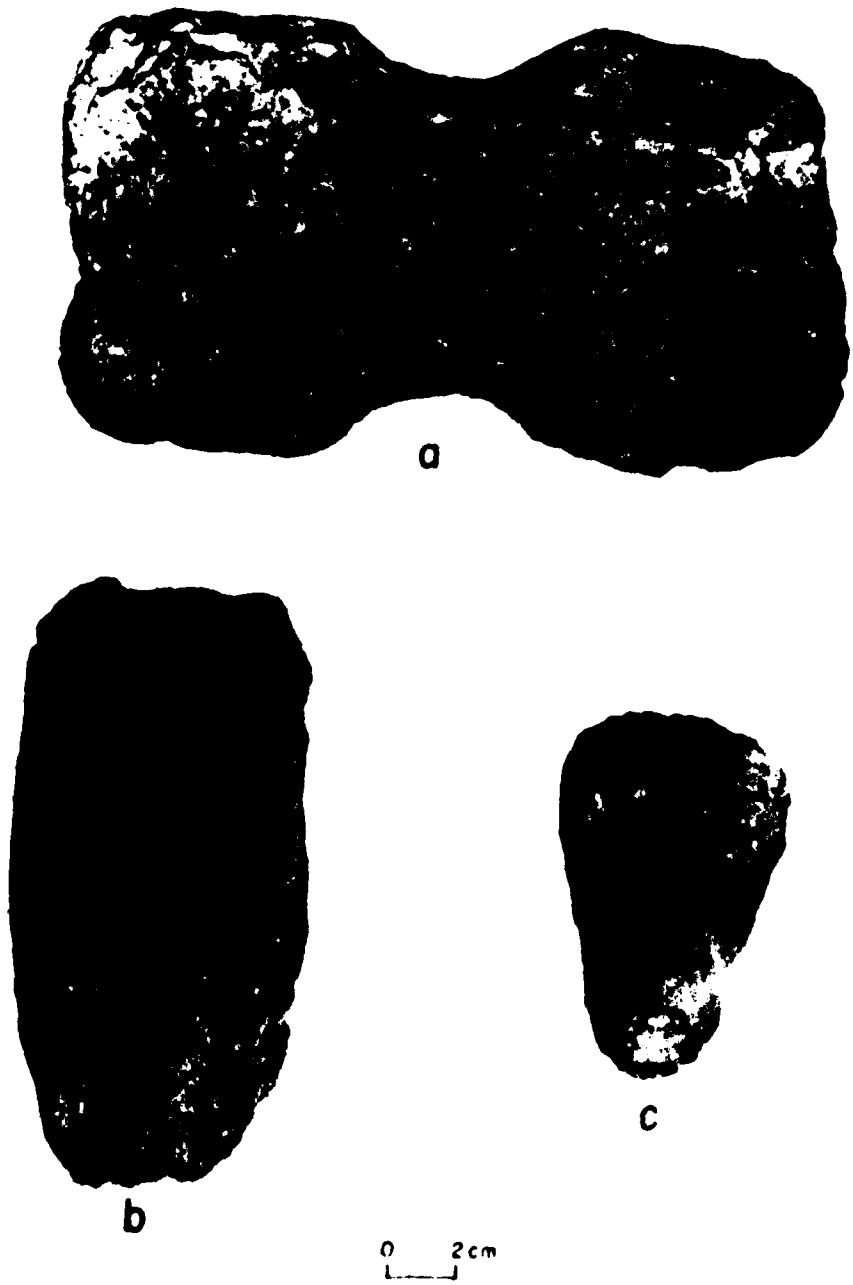

Plate 7. 3CW189 siltstone tools from the Carl Cleavenger collection. (a) double bitted biface, (b) Type IV biface, (c) Type II biface. Half scale.

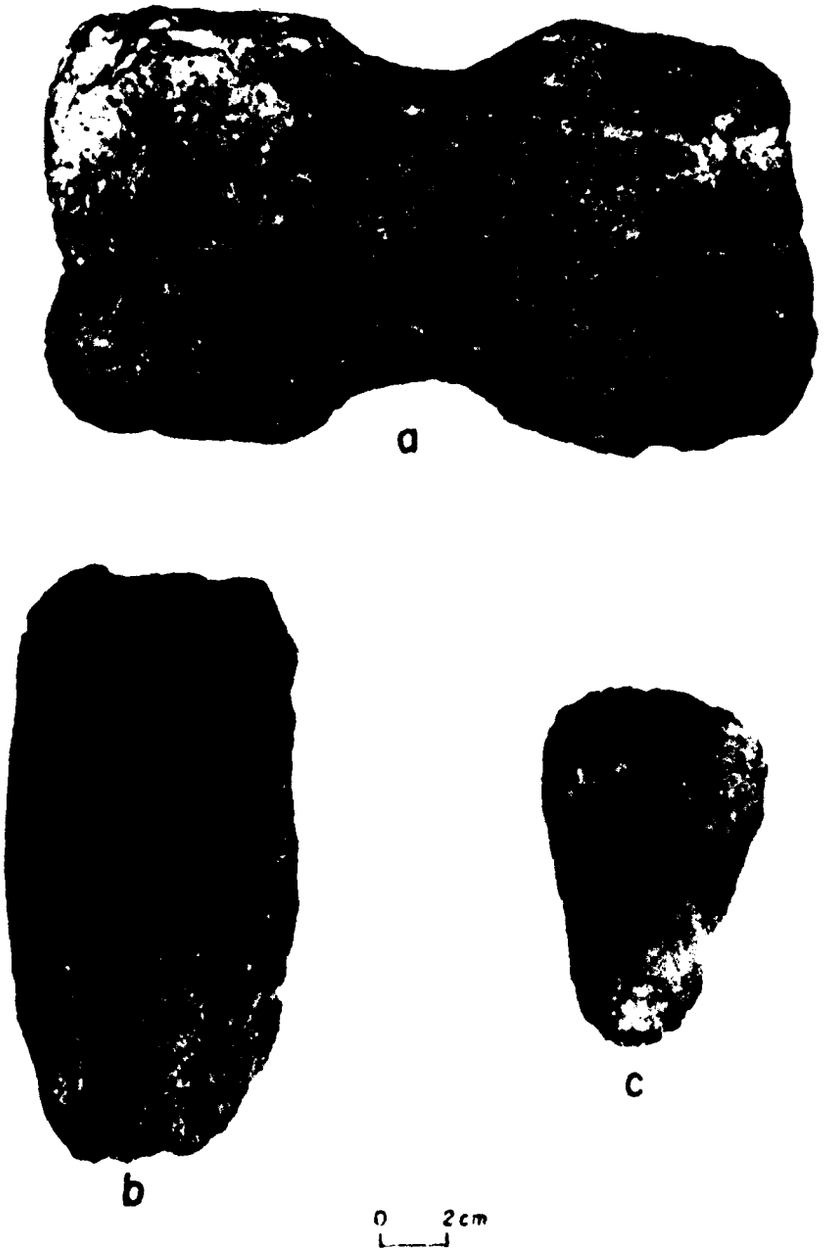

Plate 7. 3CW189 siltstone tools from the Carl Cleavenger collection. (a) double bitted biface, (b) Type IV biface, (c) Type II biface. Half scale.

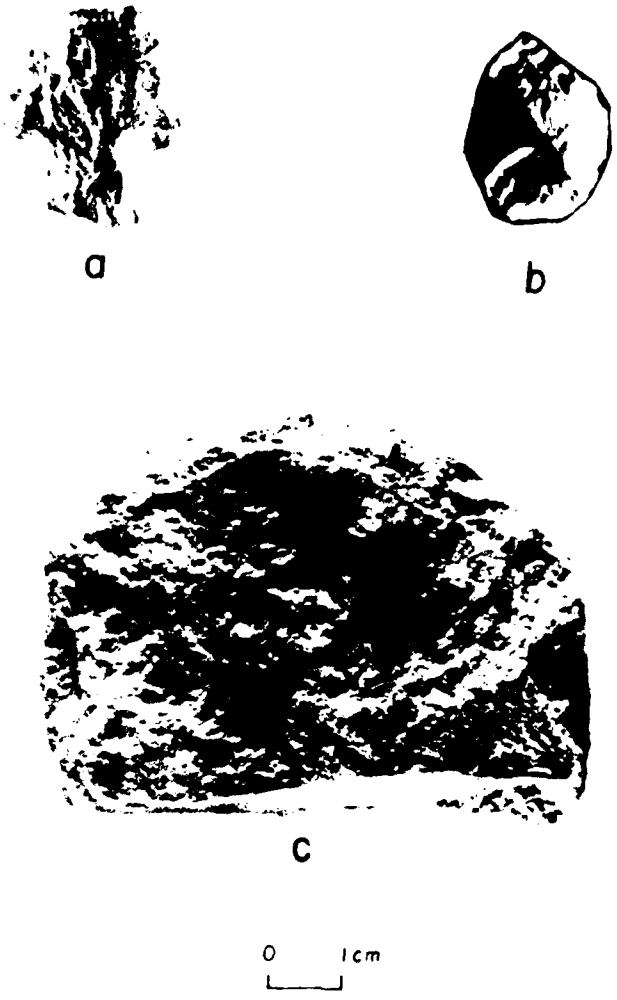

Plate 8. Artifacts from 3CW191, 3CW192, and 3CW193. (a) 3CW191: stemmed projectile point, (b) 3CW192: modified flake, (c) 3CW193: Type IV siltstone biface. Full scale.

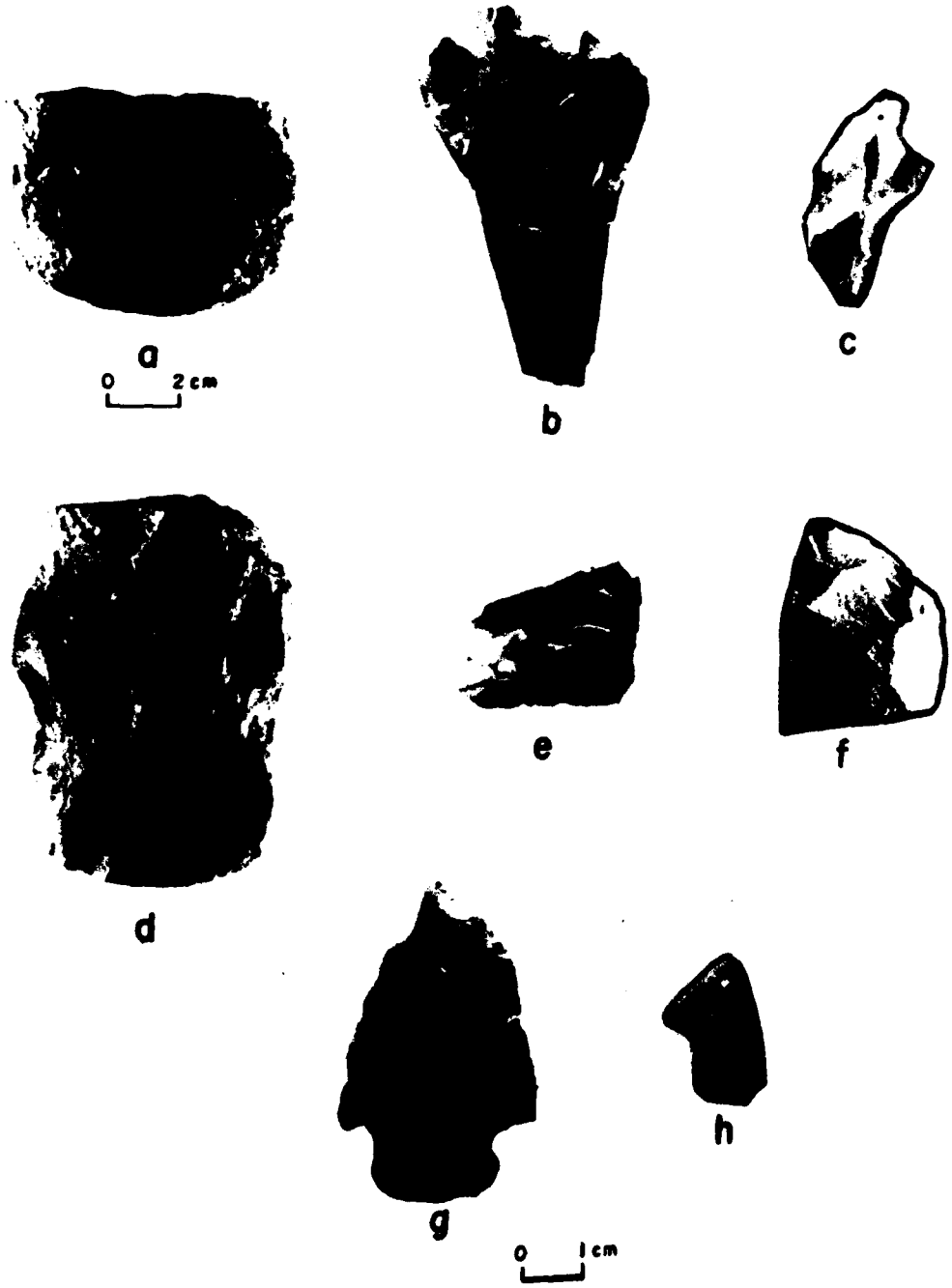

Plate 9. 3CW110 Locus 1A examples of artifacts. (a) pitted stone, (b, e, f) bifaces. (c) Gary point base, (d) Type I siltstone biface haft, (g) late Archaic point, (h) Gary point base. All full scale except for (a) half scale.

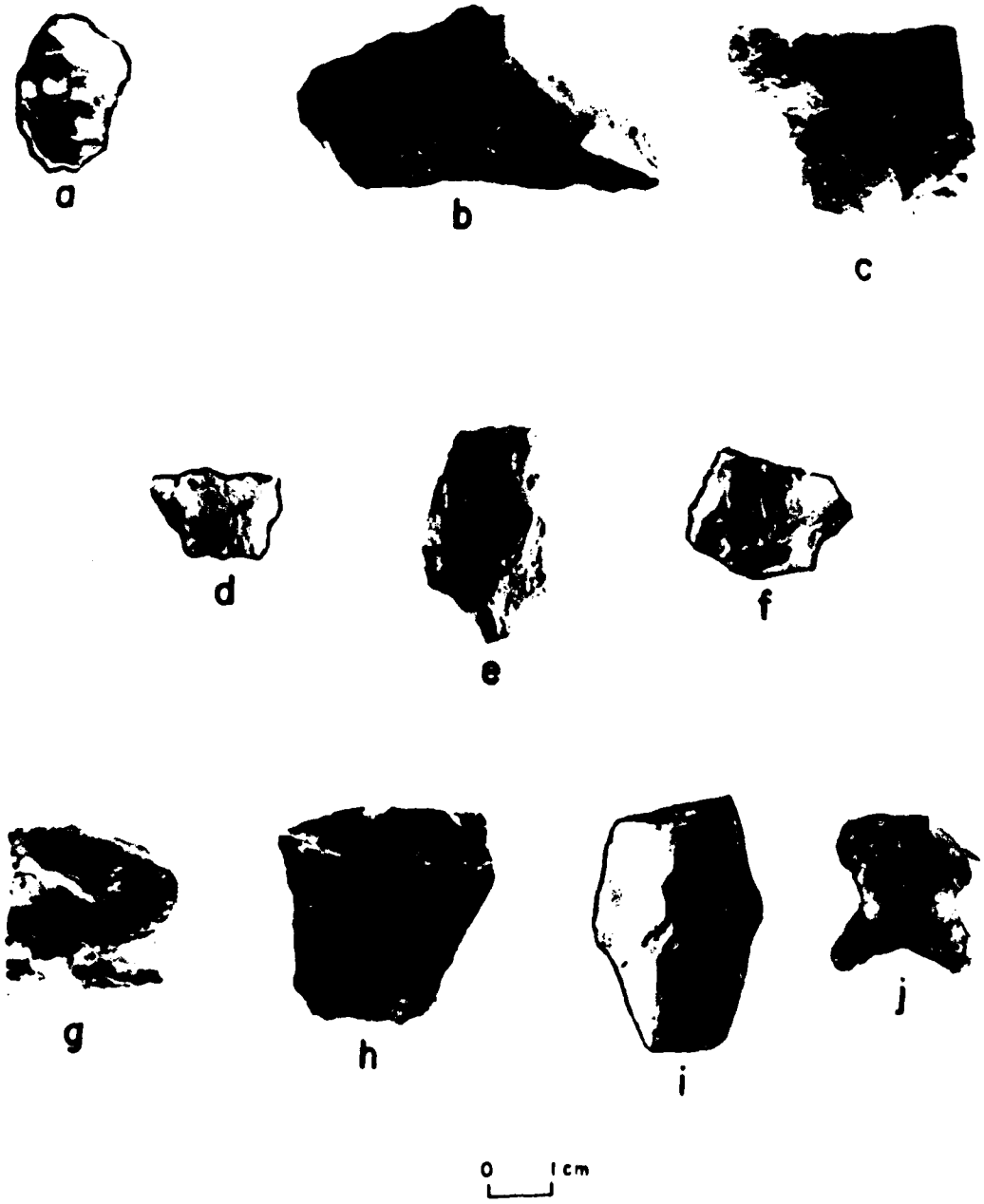

Plate 10. 3CW110 Locus 1B (a-f) and Locus 2 (g-j) examples of artifacts. (a-c) biface fragments, (d) Gary point base, (e) impact shattered point fragment, (f) impact shattered Gary point fragment, (g-h) bifaces, (i) Gary point base, (j) Fairland point base. Full scale.

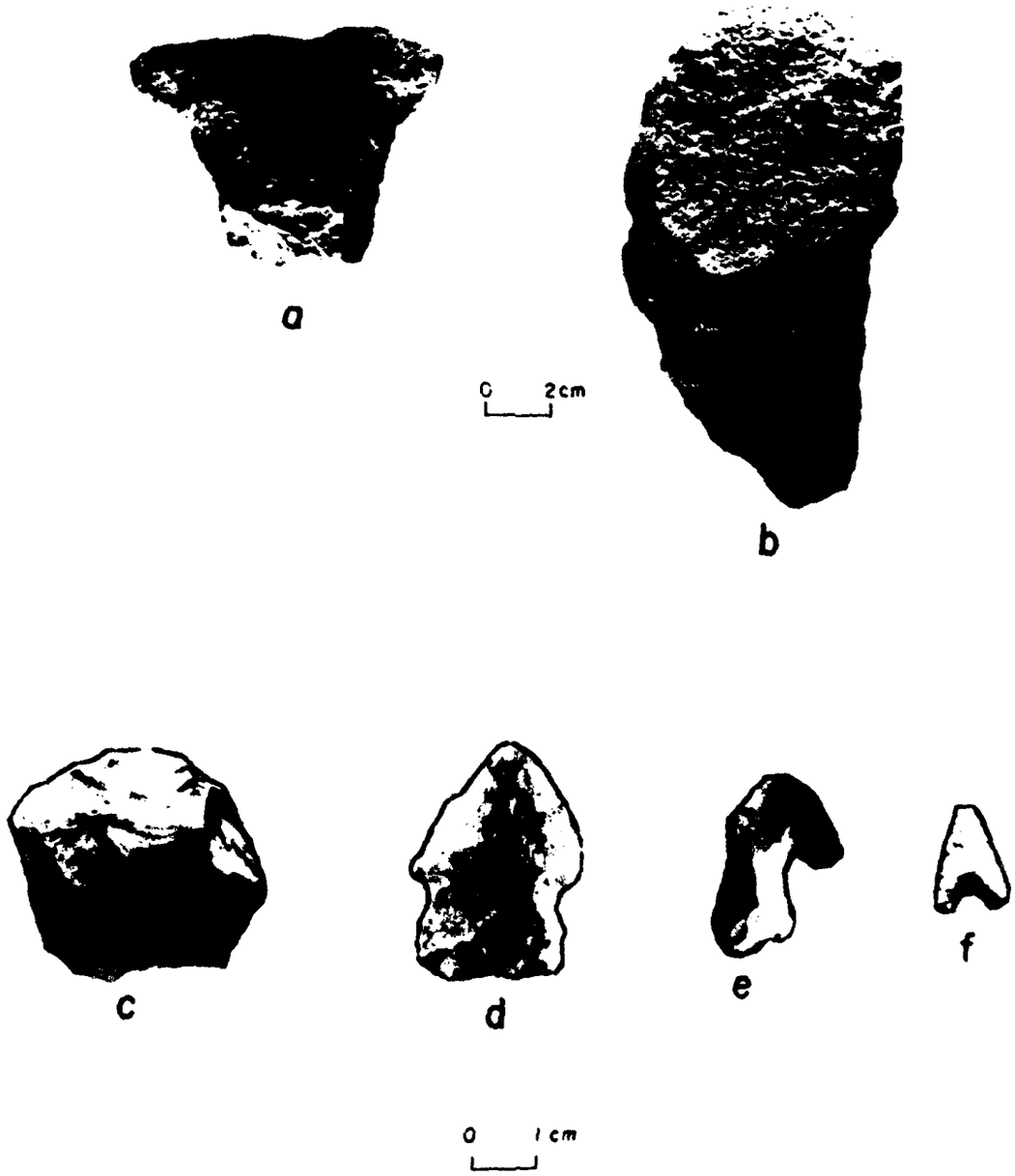

Plate 11. 3CW110 Locus 3 examples of artifacts. (a) Type I siltstone biface haft, (b) Type IV siltstone biface, (c) biface, (d) late Archaic projectile point, (e) Woodland projectile point fragment, (f) Maud arrowhead. All full scale except (a-b) half scale.

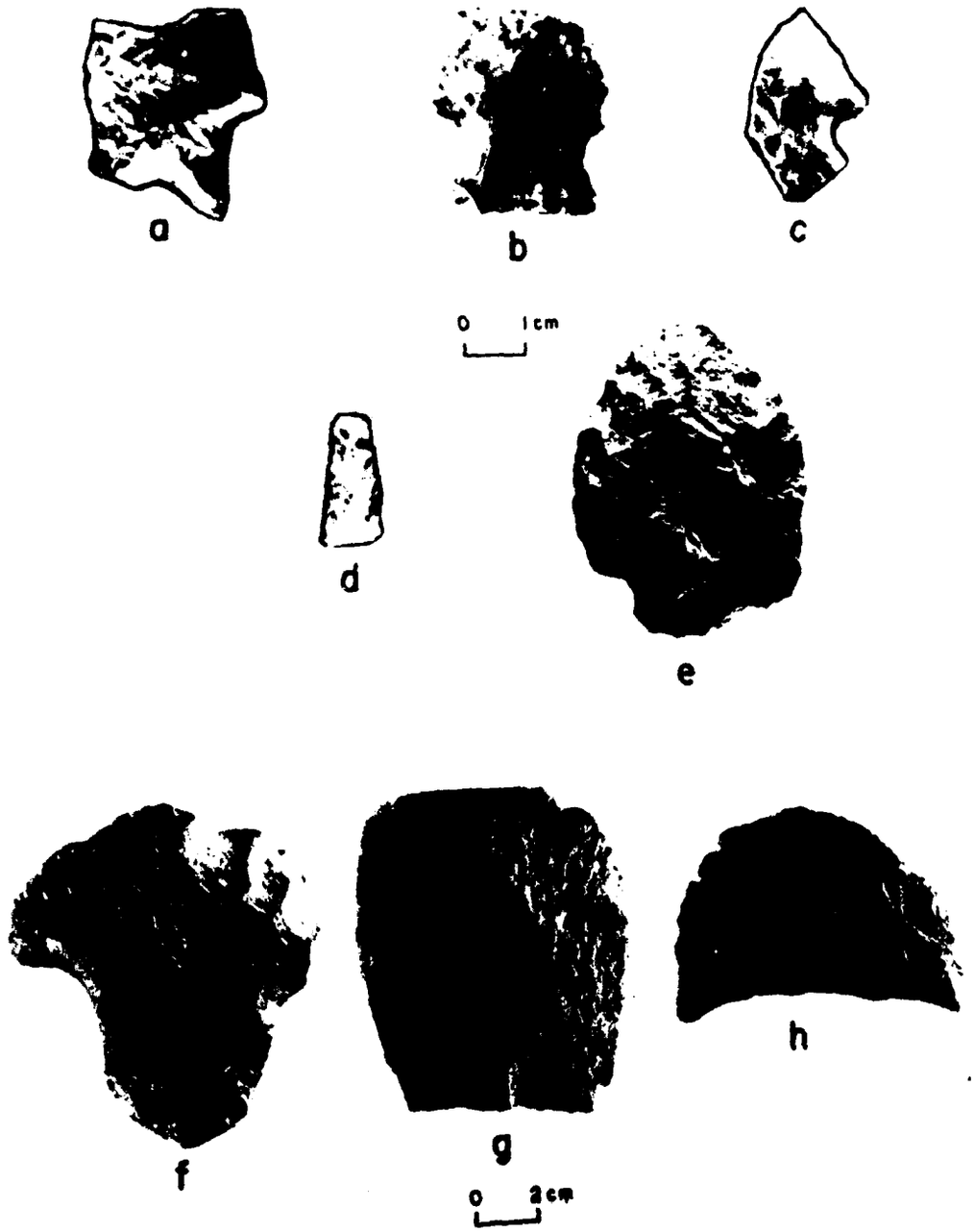

Plate 12. 3CW119 upper terrace examples of artifacts. (a) Jackie Stemmed point, (b) late Archaic point, (c) stemmed point fragment, (d) perforator fragment, (e) siltstone biface, (f) Type I siltstone biface, (g-h) Type IV siltstone bifaces. All full scale except (f-h) half scale.

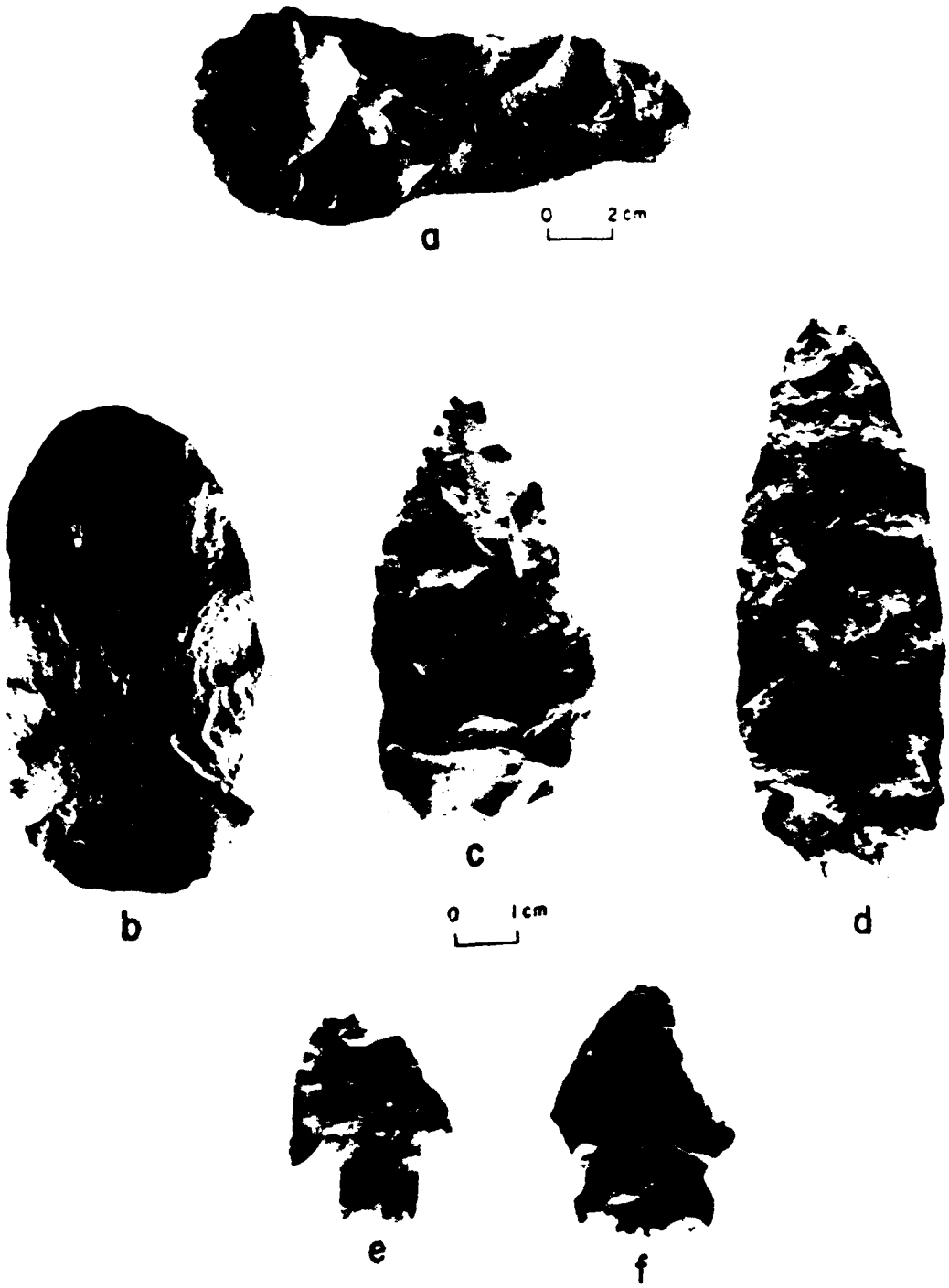

Plate 13. 3CW119 lower terrace artifacts donated by Mr. and Mrs. C. Cox. (a) Type III siltstone biface, (b) siltstone celt, (c-d) bifaces (e) Impact fractured Archaic point, (f) late Archaic to Woodland point. All full scale except (a) half scale.

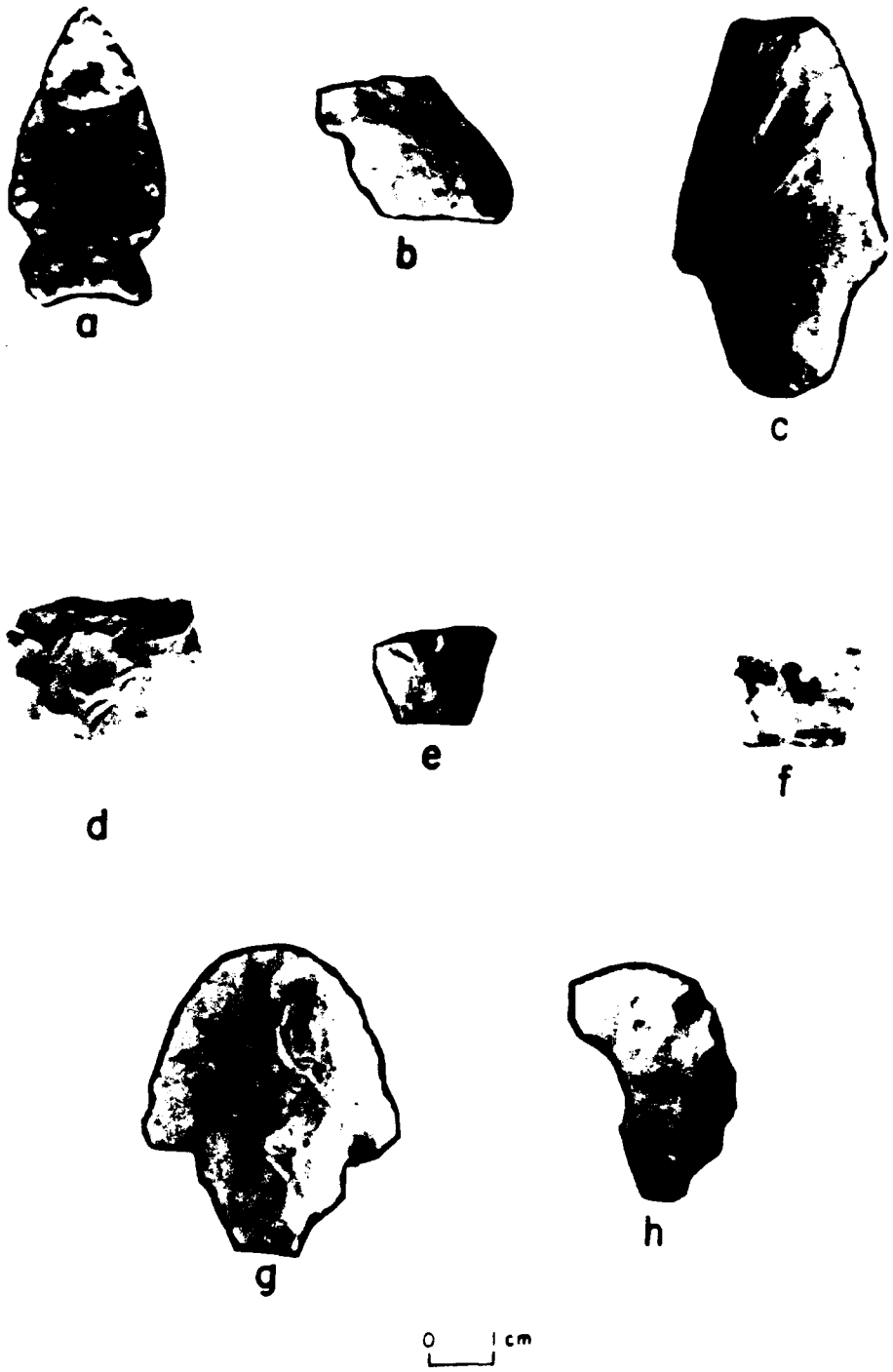

Plate 14. 3CW119 lower terrace chert tool examples. (a) Fairland late Archaic point, (b) late Archaic point, (c) Gary point, (d) Gary point fragment, (e-f) stems of Langtry or Gary points, (g) biface "scraper", (h) biface with beveled edge. Full scale.

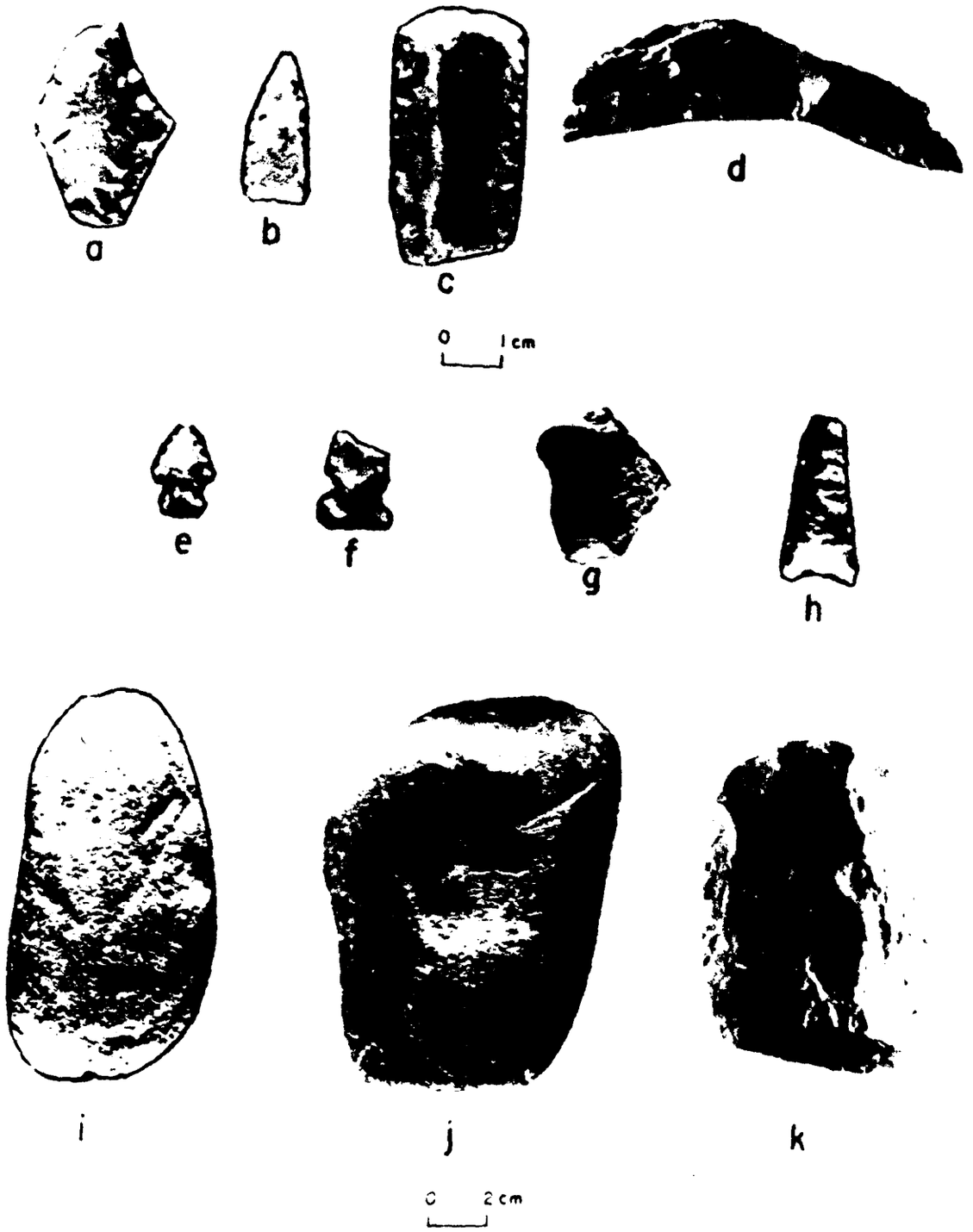

Plate 15. 3CW119 artifact examples from the lower terrace garden. (a) Gary point, (b) Shetley arrowhead, (c-d) scrapers, (e) Scallorn arrowhead, (f) Reed arrowhead, (g) Gary point fragment, (h) Fresno or Talco arrowhead, (i) hammerstone, (j) pitted stone, (k) Type IV siltstone biface. All full scale except (i-k) half scale.

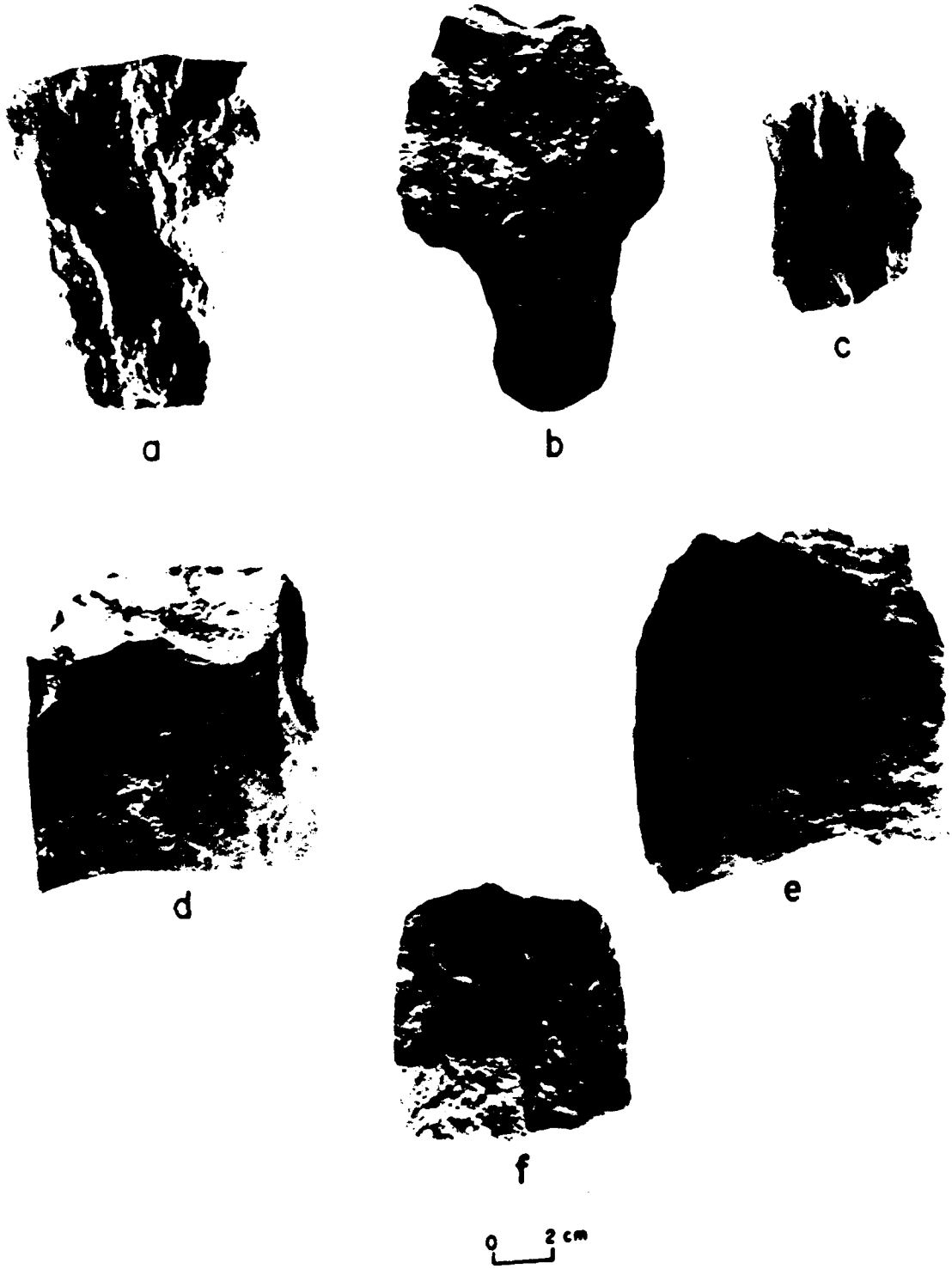

Plate 16. 3CW119 lower terrace siltstone biface examples. (a-b) Type I, (c) Type I haft, (d-f) Type IV. Half scale.

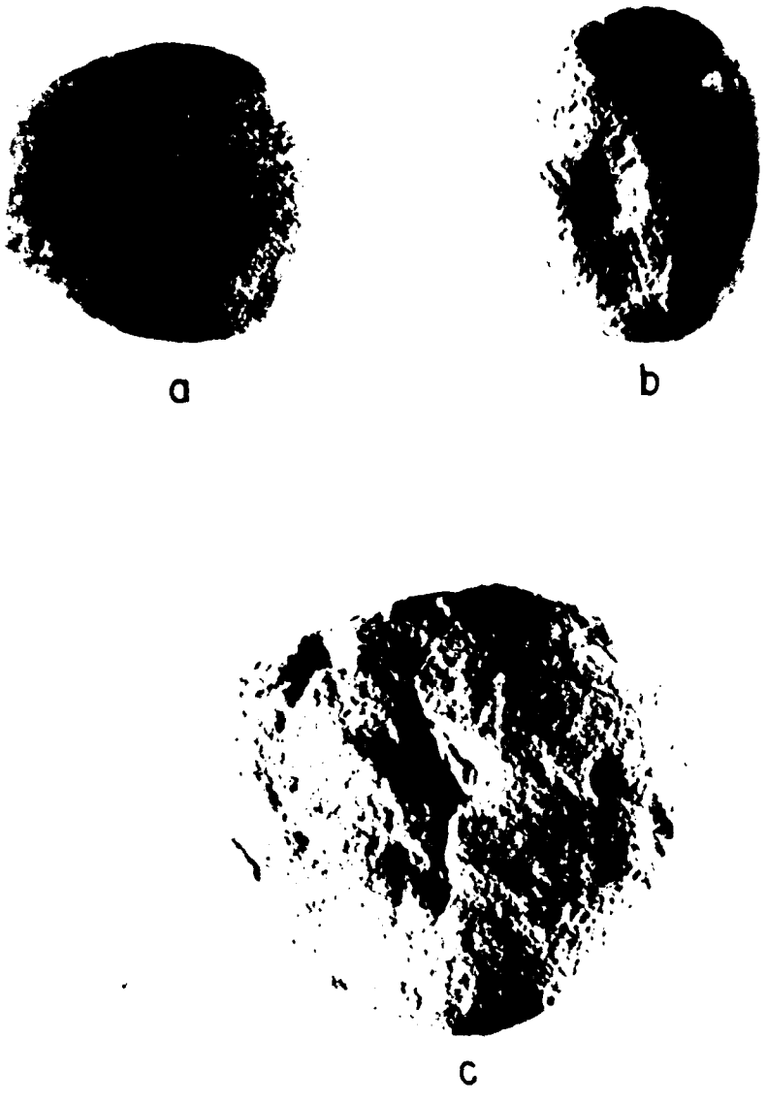

Plate 17. 3CW119 lower terrace pitted stone tool examples. Half scale.

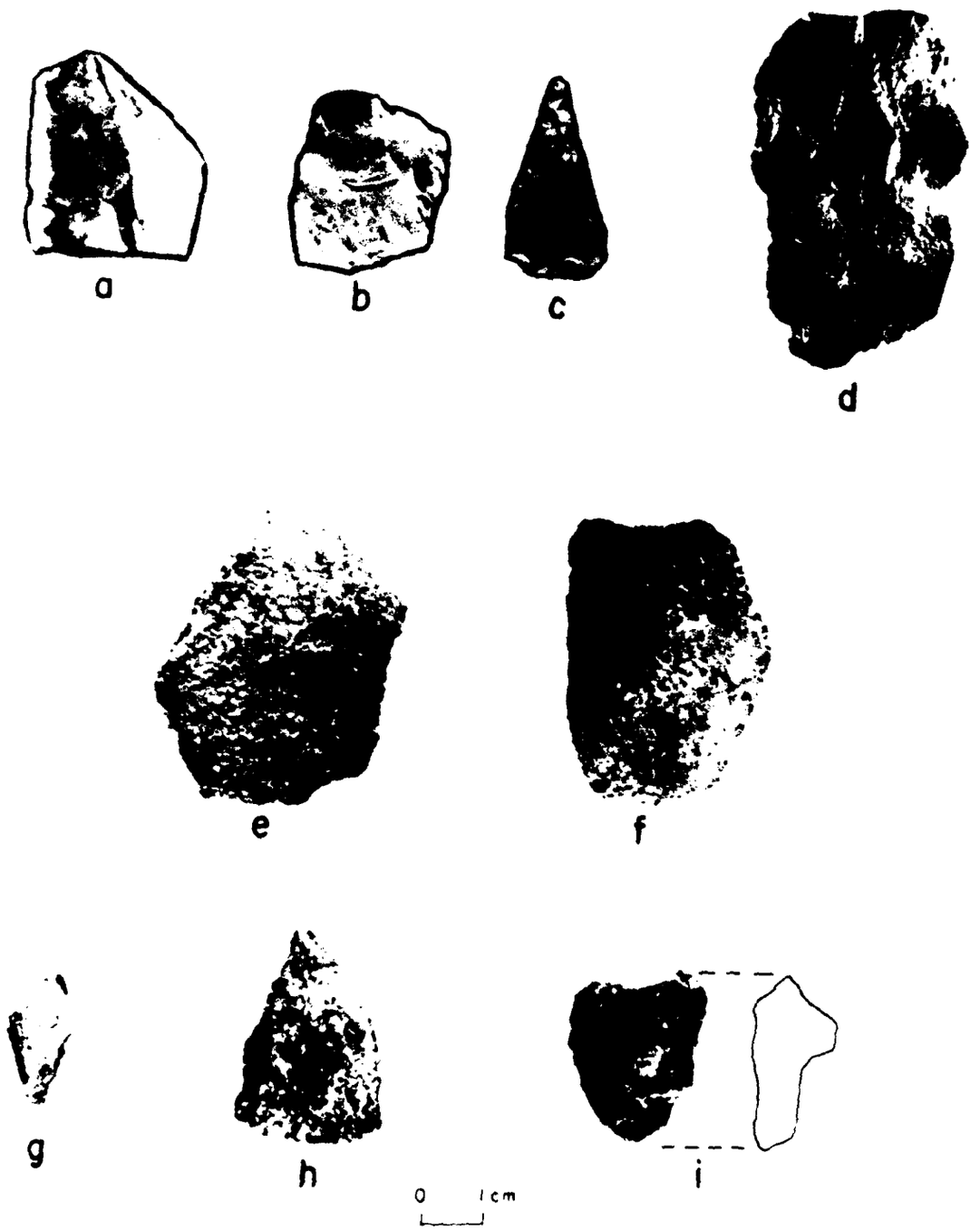

Plate 18. 3CW6 Shelter E 1979 examples of artifacts. (a-b) modified flakes, (c) Fresno or Madison point, (d) biface, (e-f) Williams Plain body sherds, (g) cf. Mississippi Plain, var. Coker body sherd, (h) Woodward Plain body sherd, (i) Woodward Plain sherd with node. Full scale.

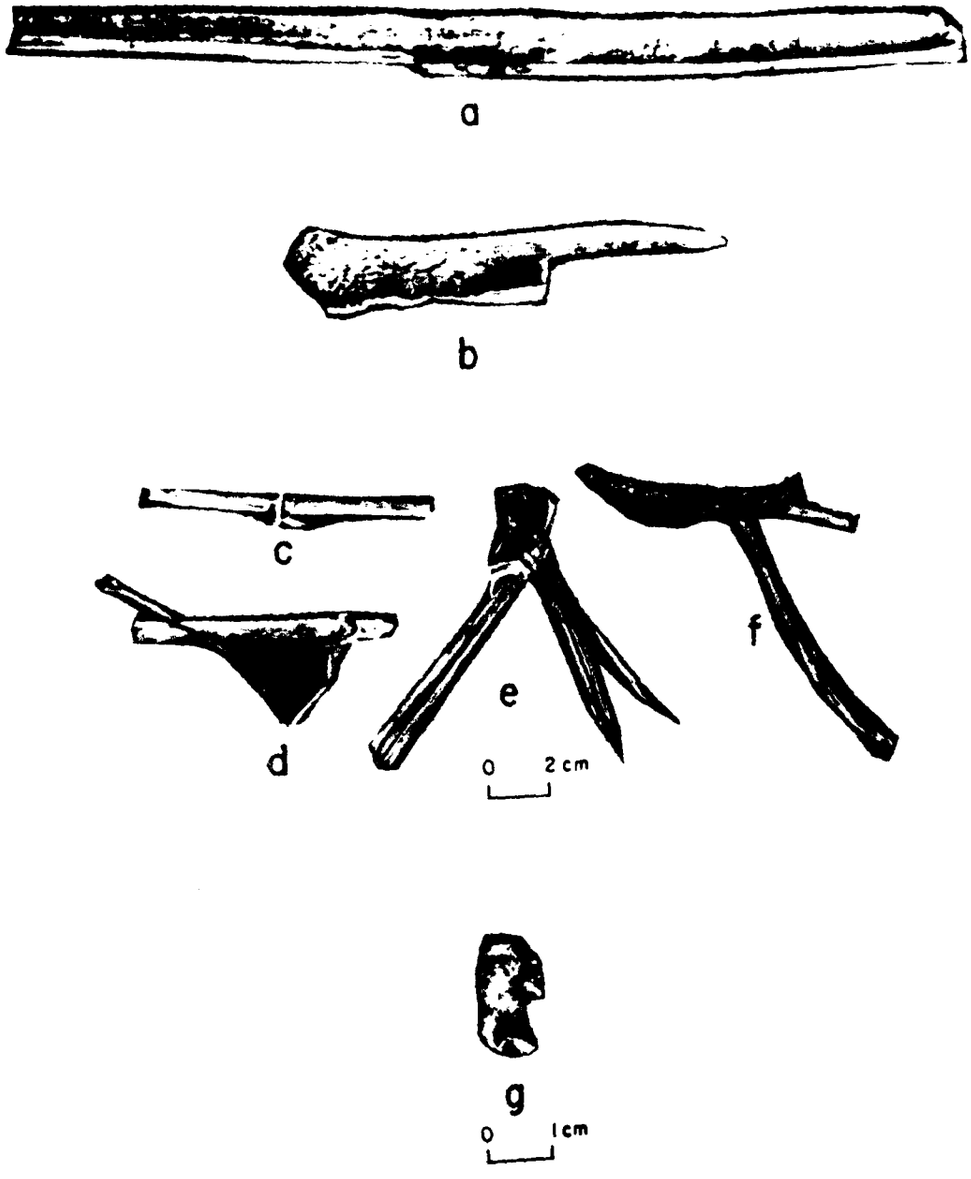

Plate 19. 3CW6 Shelter C examples of artifacts collected in 1934. (a) modified cane, (b) bone tool, (c) stick with overhand knot, (d) stick with half hitch knot, (e) stick with double overhand knot, (f) stick with two half hitch knots, (g) Sequoyah arrowhead. All half scale except (g) full scale.

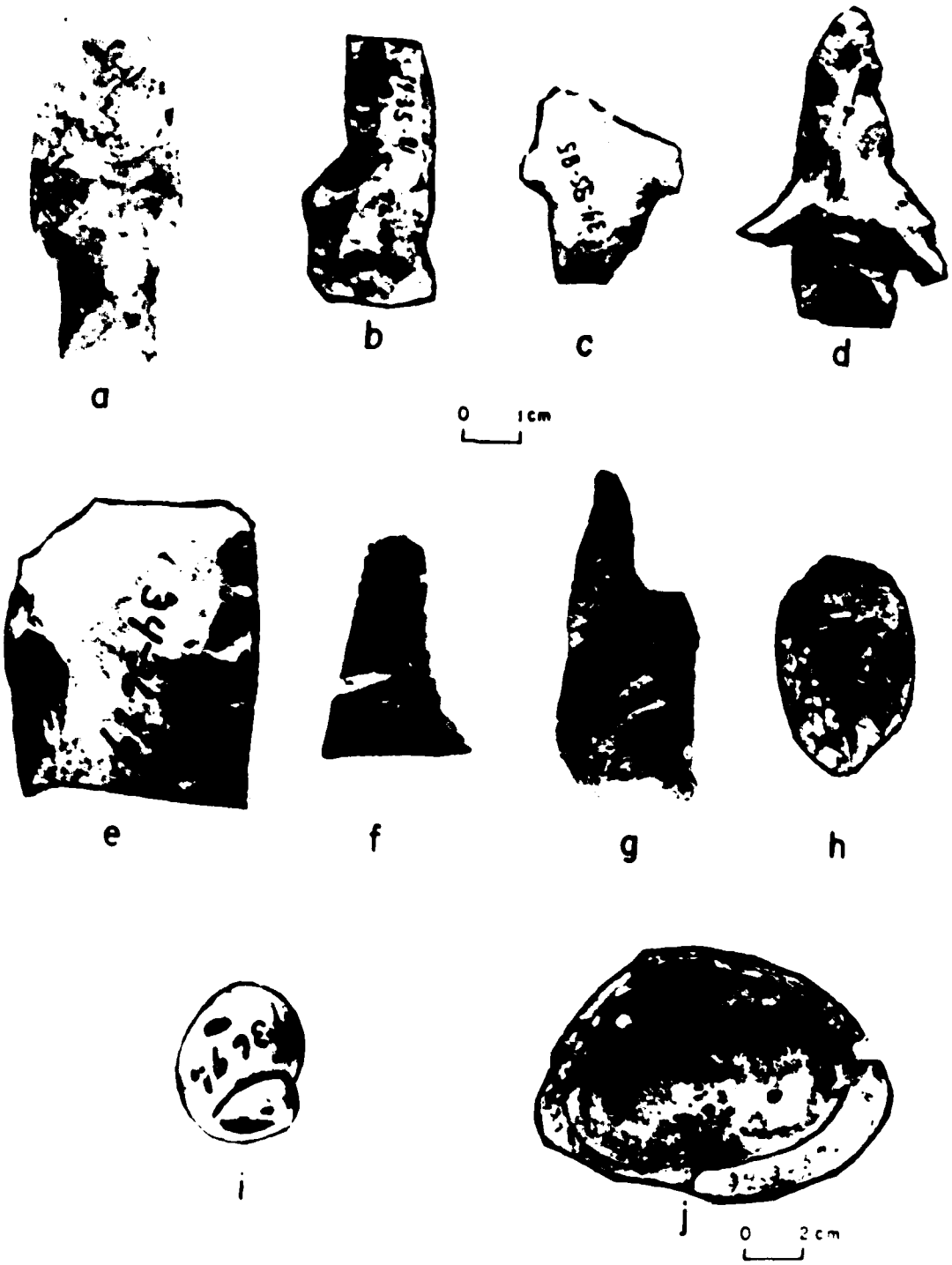

Plate 20. 3CW6 Shelter E stone and shell examples of artifacts collected in 1934. (a) stemmed point, (b) reworked biface, (c) Gary point base, (d) reworked point, (e-g) modified flakes, (h) flake scraper, (i) shell head, (j) drilled shell. All full scale except (j) half scale.

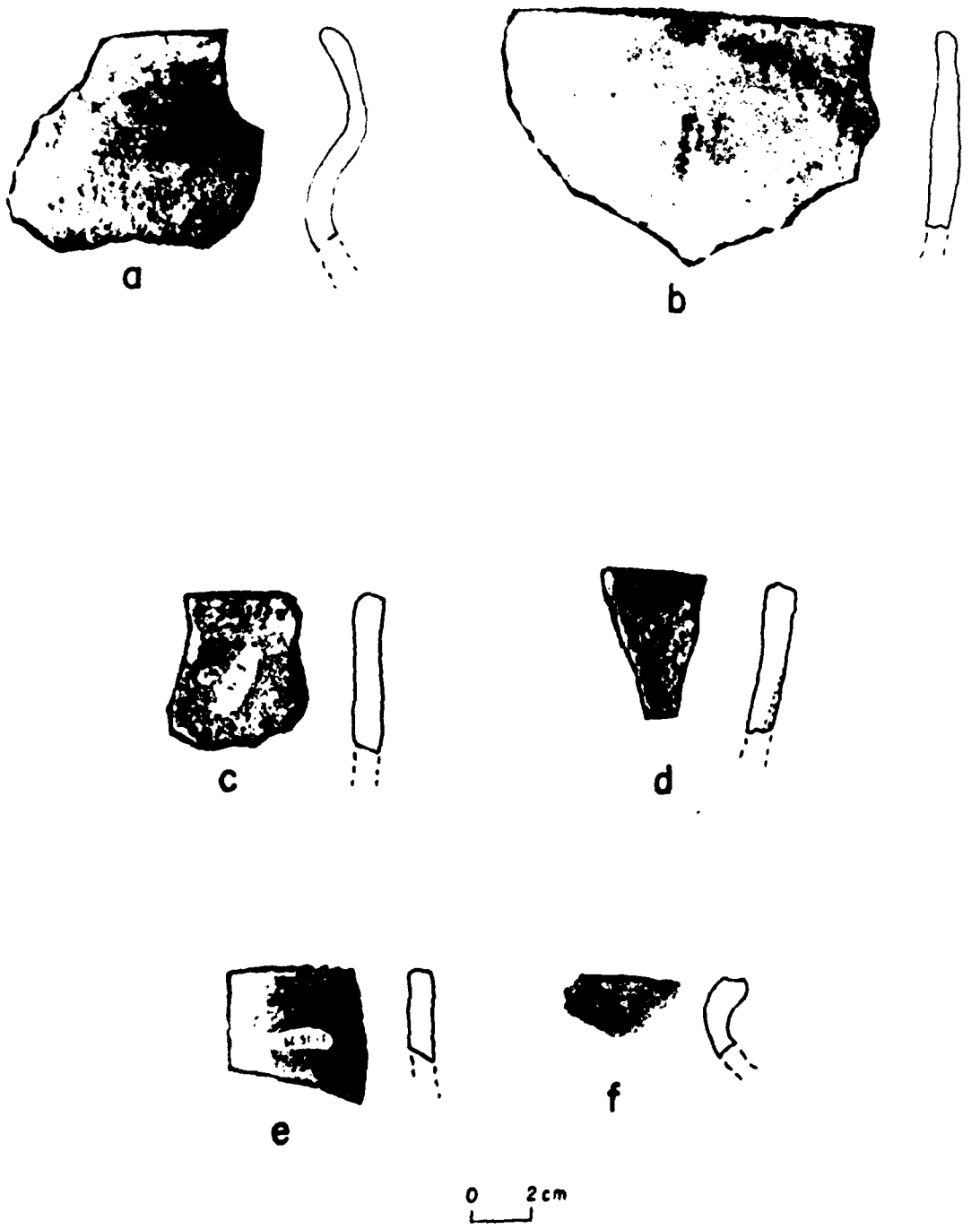

Plate 21. 3CW6 Shelter E examples of ceramic rims. (a) Paris Plain "direct rounded" rim, (b) cf. Mississippi Plain, var. Coker, "direct rounded" rim, (c) cf. Mississippi Plain, var. Mound Field, "expanding flat" rim, (d) cf. Mississippi Plain, var. Mound Field, "expanding rounded" rim, (e) Woodward Plain, "expanding flat" rim, (f) Woodward Plain, "rolled flat" rim. Half scale.

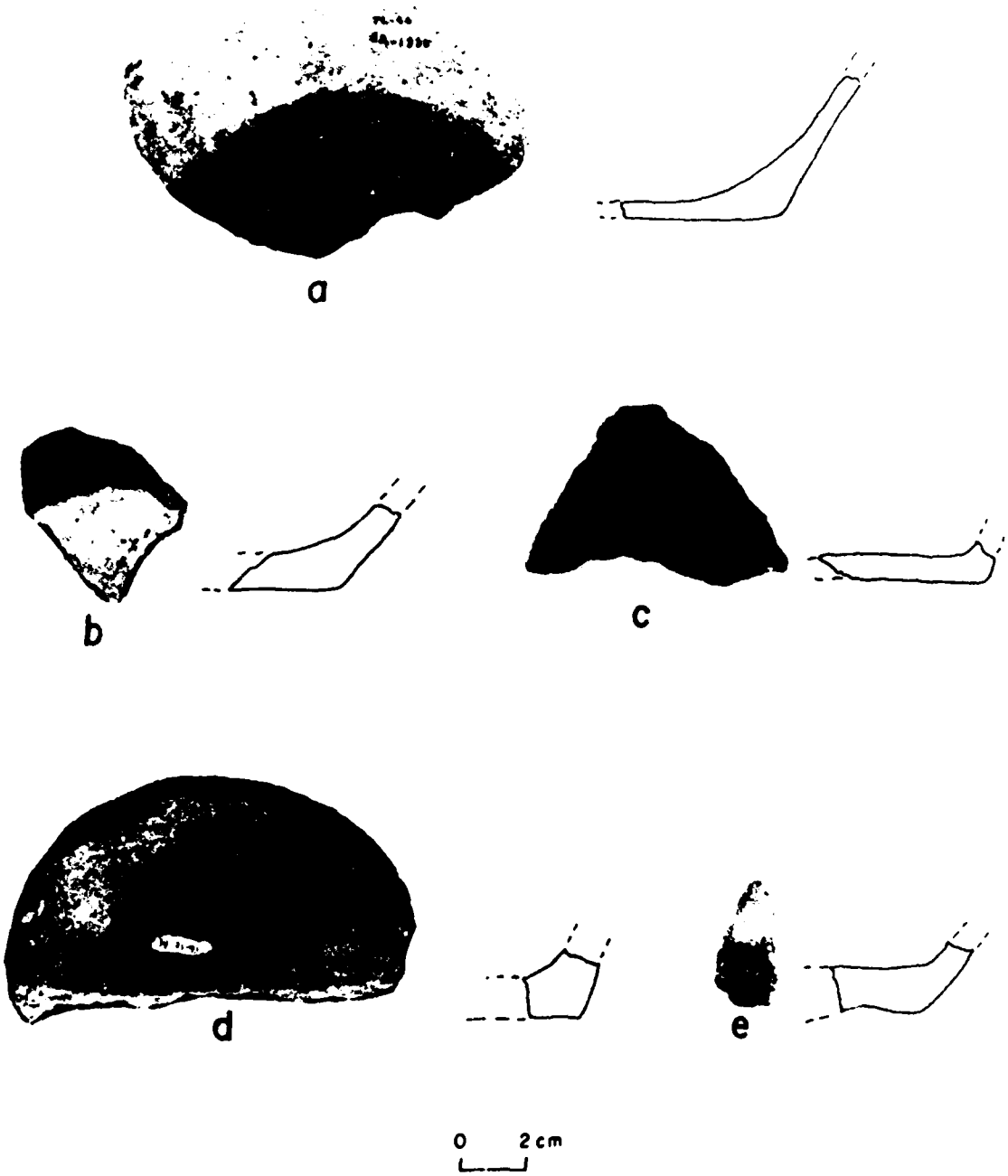

Plate 22. 3CWb Shelter E examples of ceramic bases. (a,b,d) Woodward Plain "defined" base (c and e) Woodward Plain "rounded undefined" bases. Half scale.

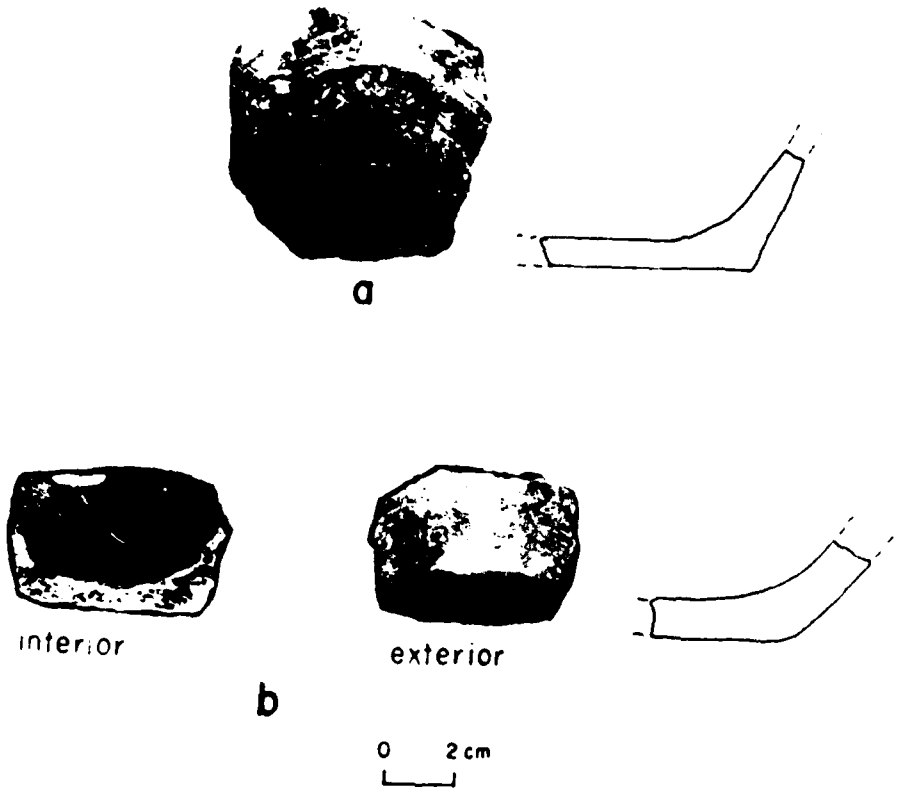

Plate 23. 3CW6 Shelter E examples of ceramic bases. (a) Paris Plain "defined" base, (b) Paris Plain intermediate "stilted/defined" base. Half scale.

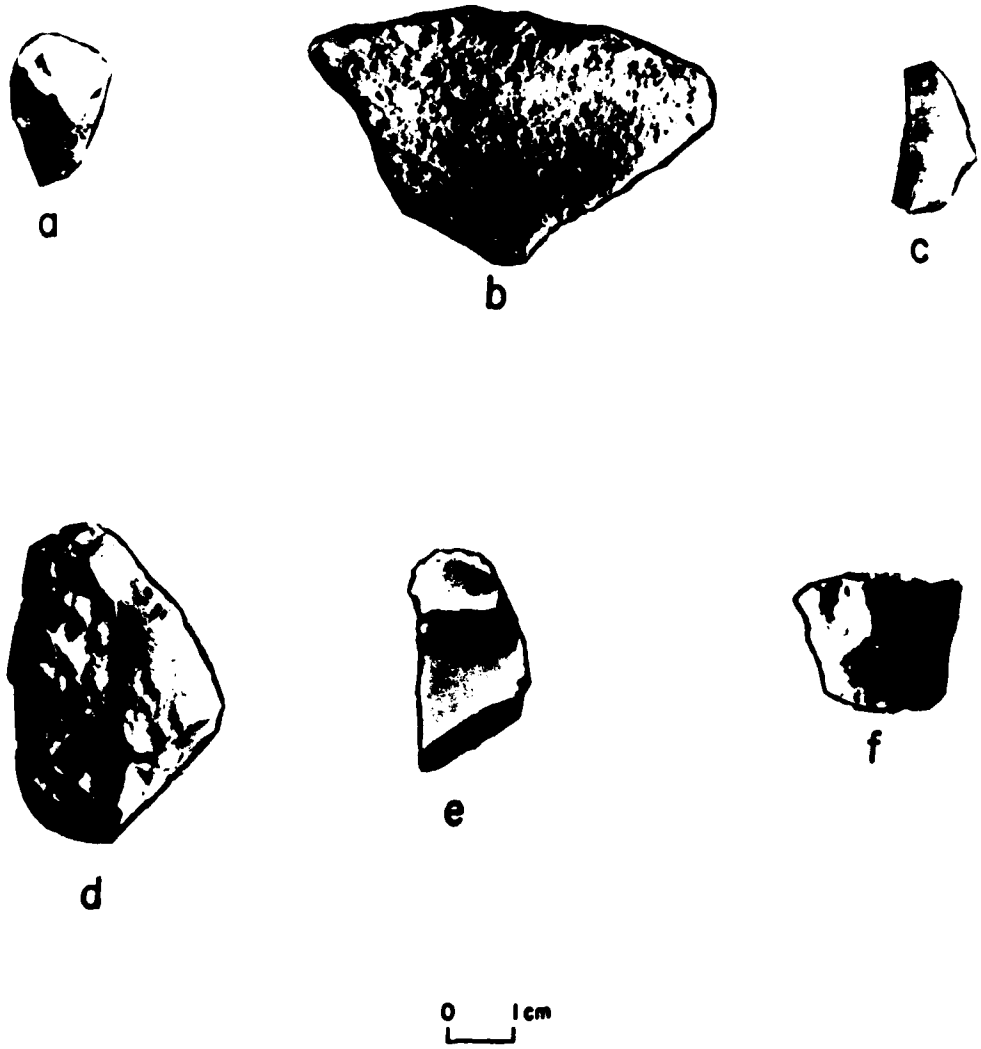

Plate 24. 3CW7 Shelter 9 examples of artifacts recovered in 1979. (a) biface fragment, (b) Woodward Plain body sherd, (c-d) biface fragments, (e-f) modified flakes. Full scale.

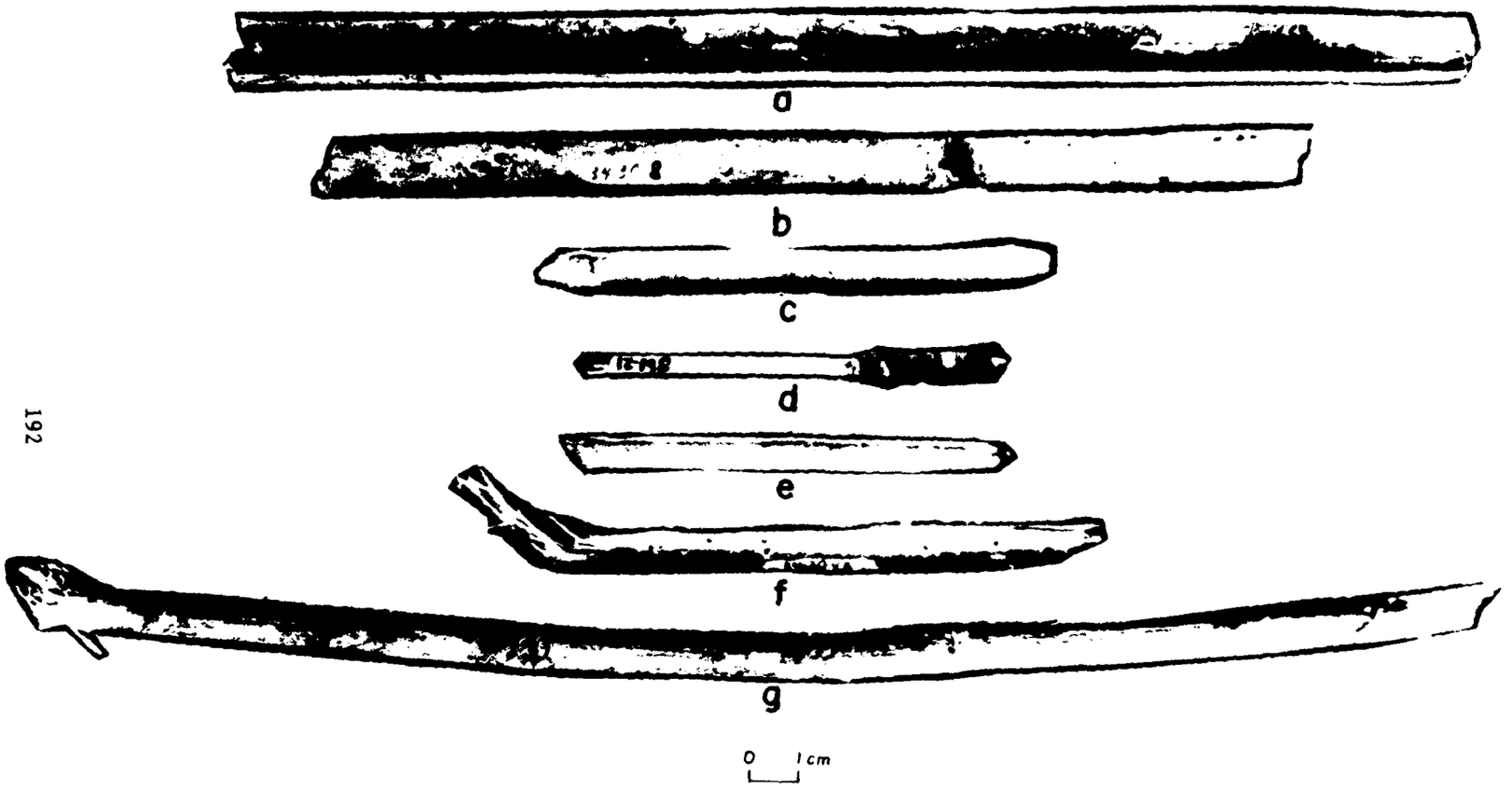

Plate 25. 3CW7 Shelter 1 cane and wood examples of artifacts from the 1934 collections. (a,e) modified cane, (b) cut stick, (c) modified stick, (d) cane with leather "swab", (f-g) stick found upright. Three-fourths scale.

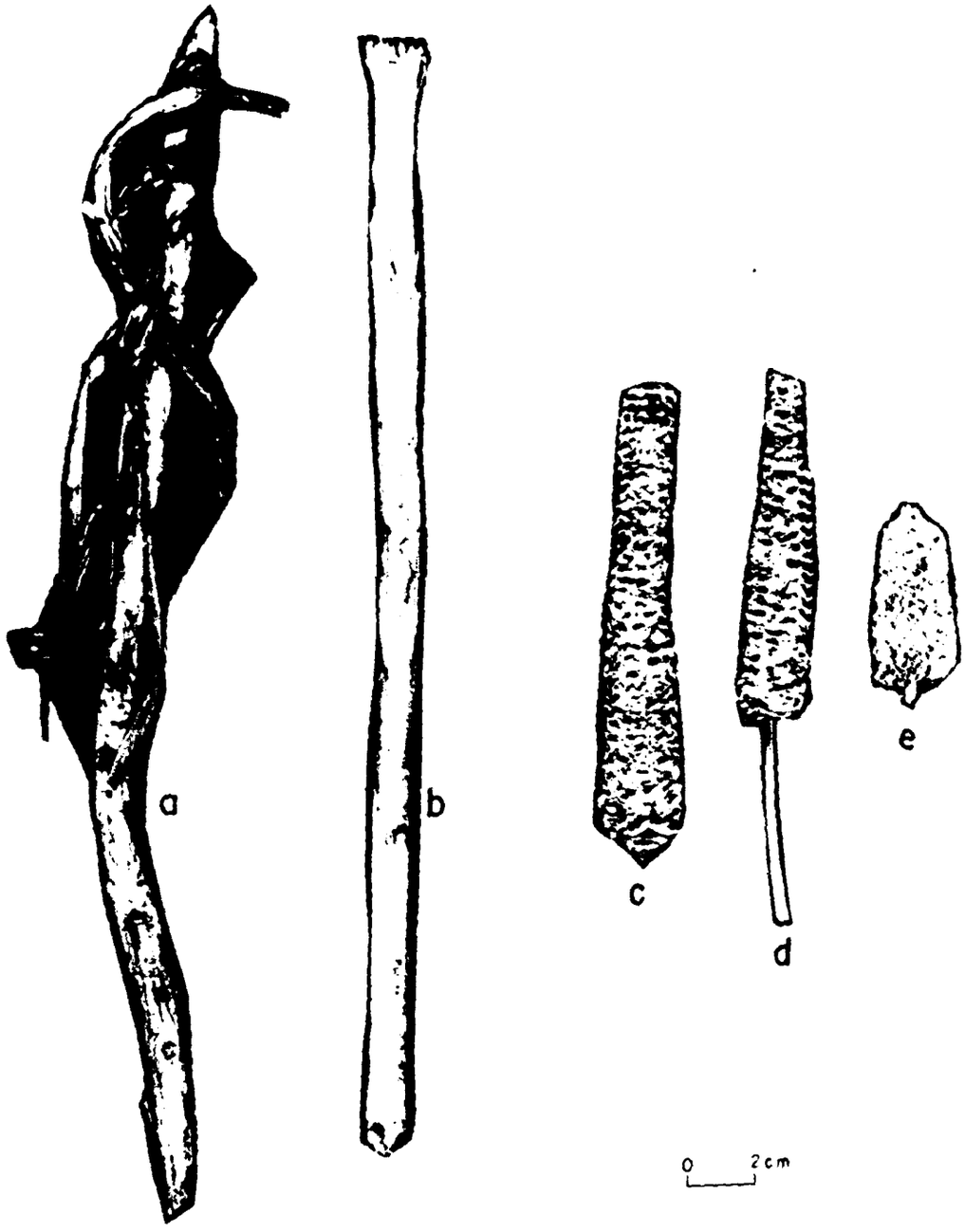

Plate 26. 3CW7 Shelter 1 central stakes and bait for possible snare collected in 1934. (a) blades of yucca tied in an overhand knot on a stake, (b) stake, (c-e) corn on cane splints. Half scale.

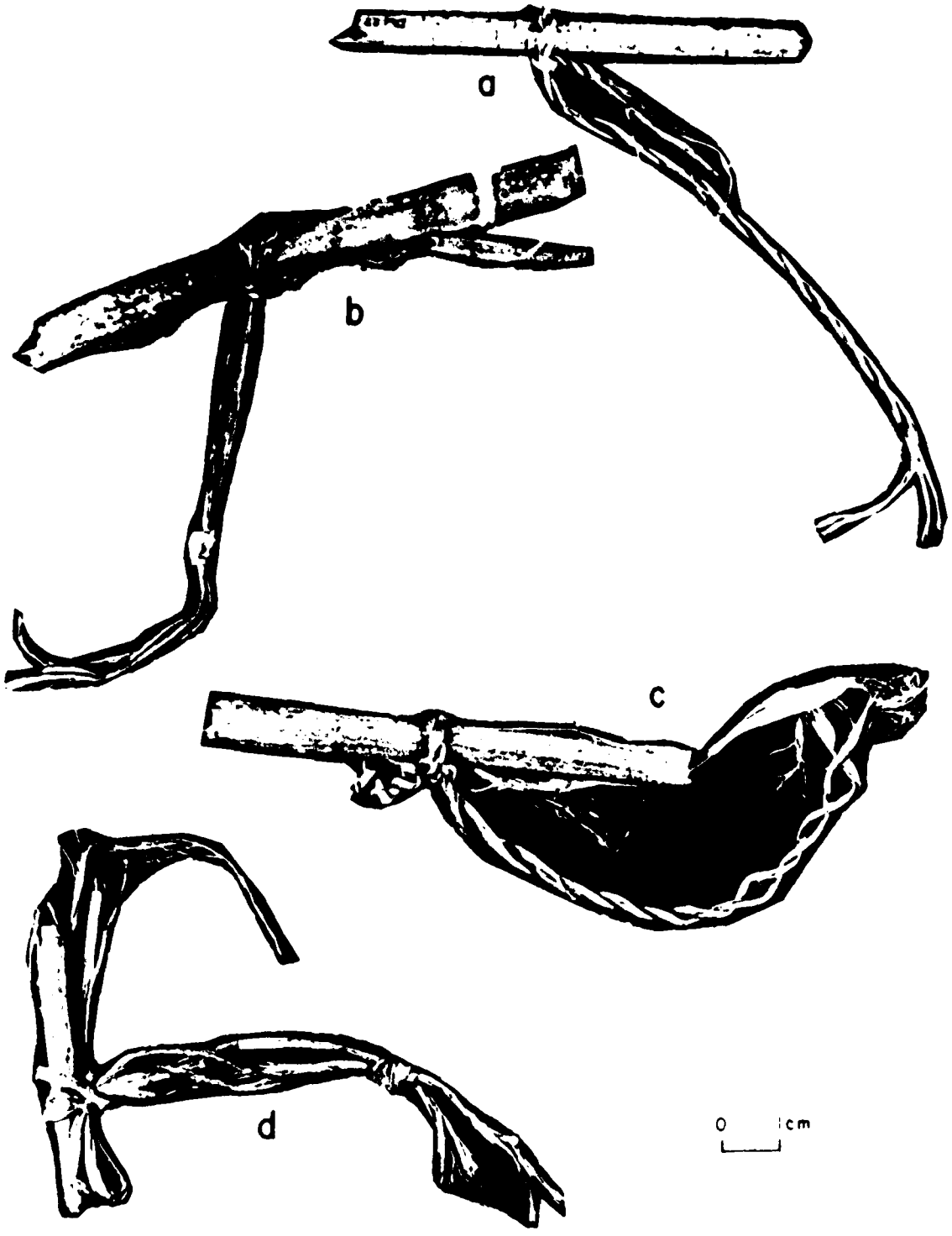

Plate 27. 3CW7 Shelter 1 sticks with knots examples found in 1934. (a) overhand knot, (b) double overhand and overhand knot, (c) Type PC3-a cordage with overhand knot, (d) double overhand knot. Full scale.

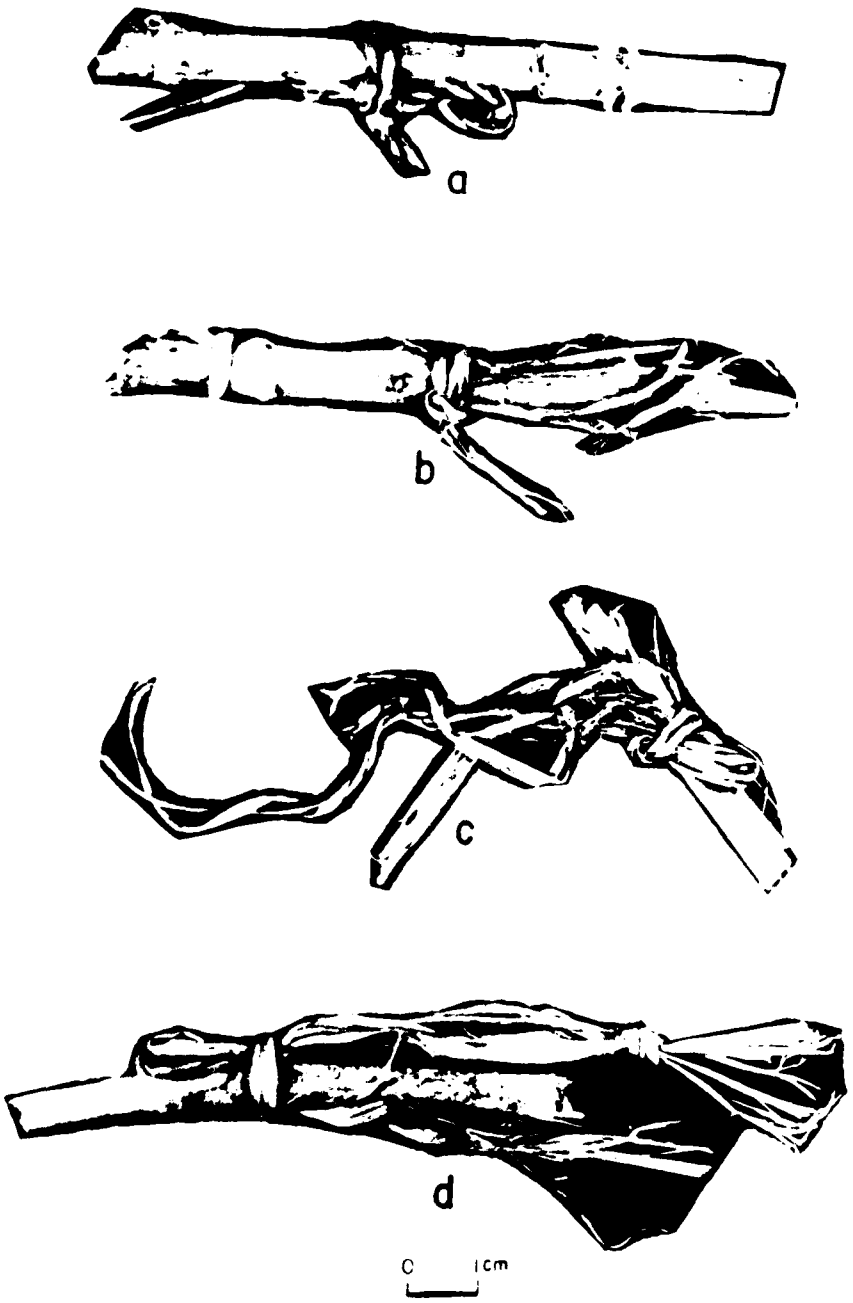

Plate 28. 3CW7 Shelter 1 sticks with knots examples found in 1934. (a,b,d) overhand knots, (c) double overhand knot. Full scale.

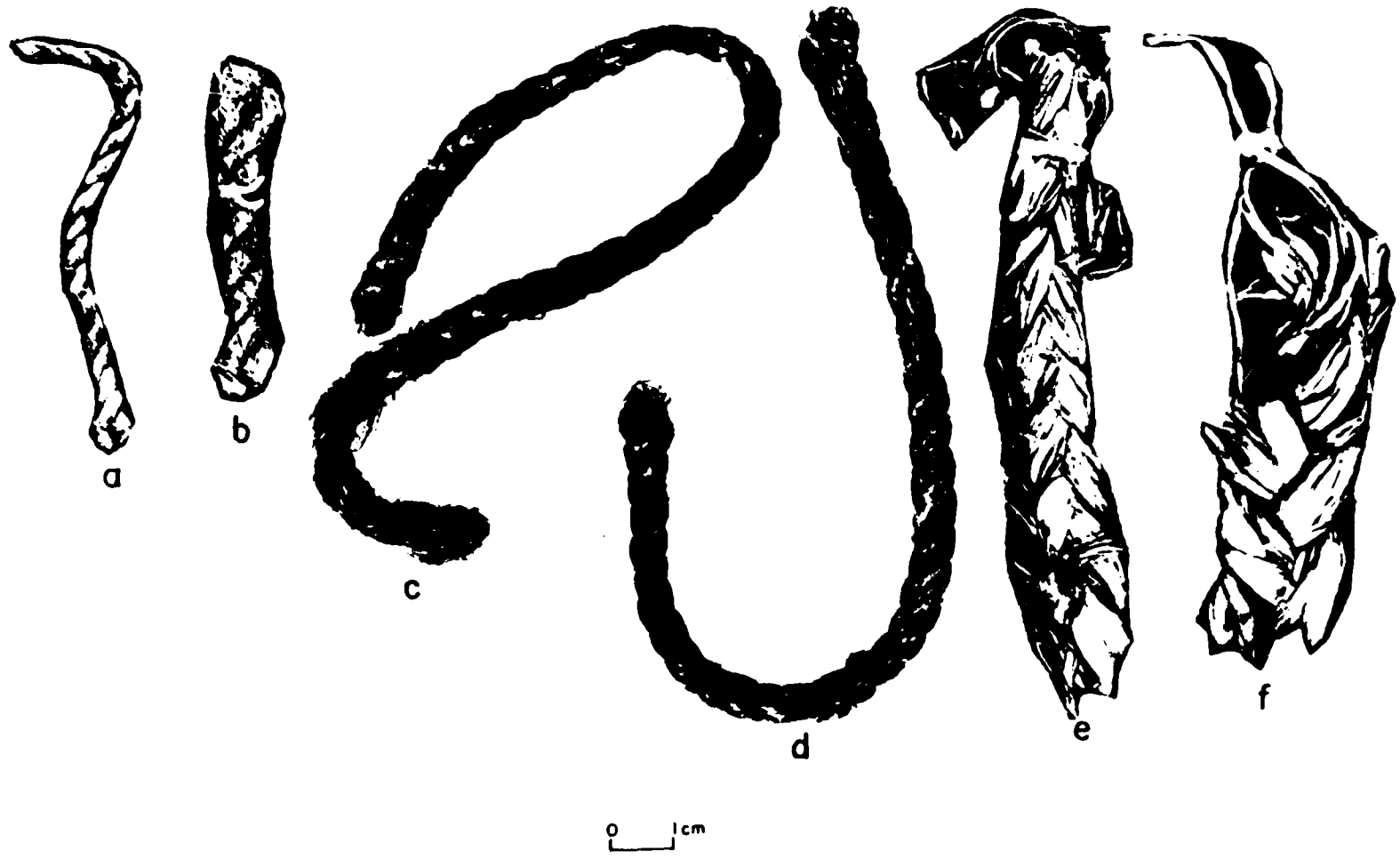

Plate 29. 3CW7 Shelter 1 cordage examples collected in 1934. (a) Type PC4, (b-d) Type PC8, (e-f) Type BC1-a. Full scale.

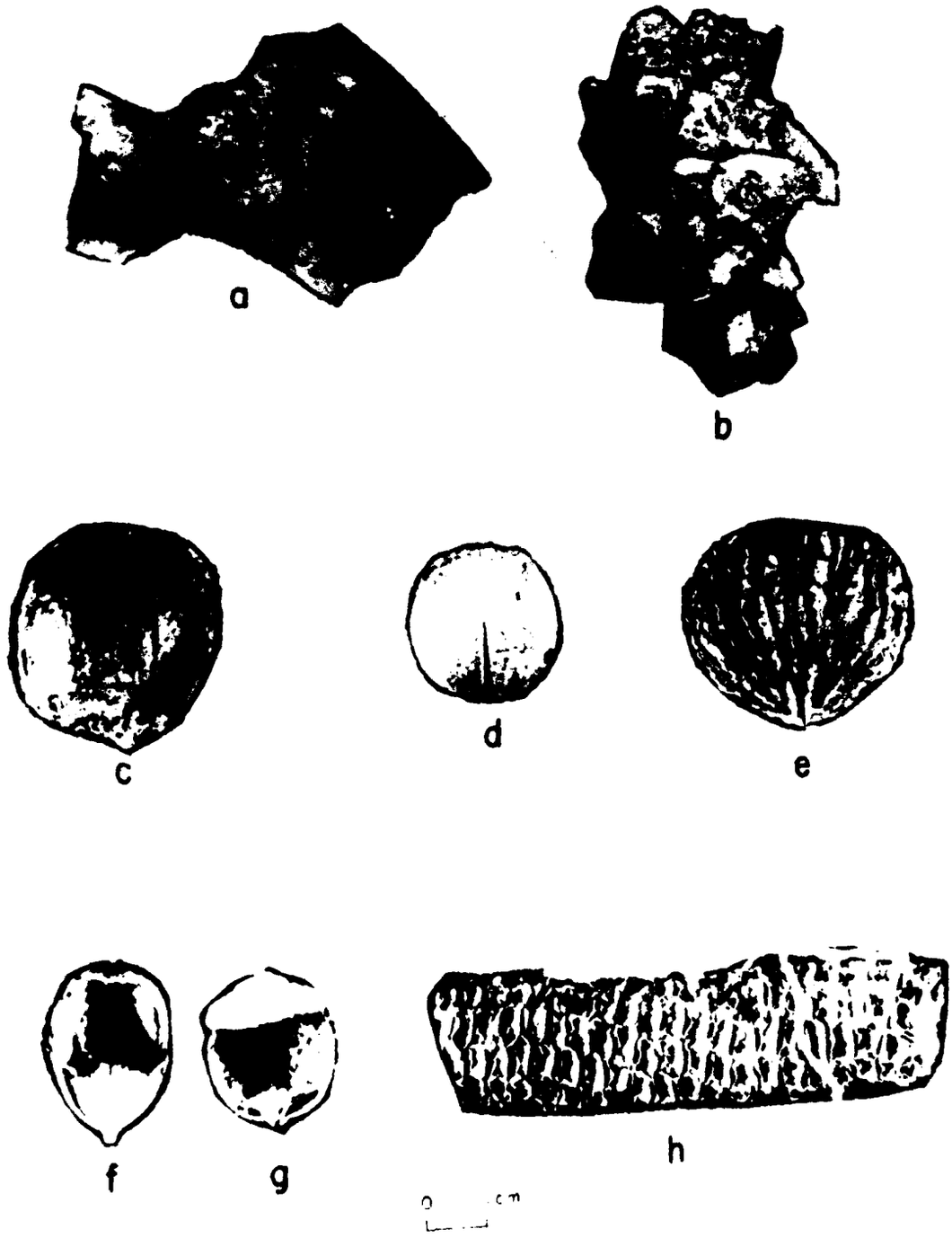

Plate 30. 3CW7 Shelter 1 vegetal food remains examples recovered in 19[illegible]4. (a) squash or gourd rind, (b) Jerusalem artichoke, (c) hickory nut in husk, (d) hickory nut, (e) black walnut, (f-g) acorns, (h) corn. Full scale.

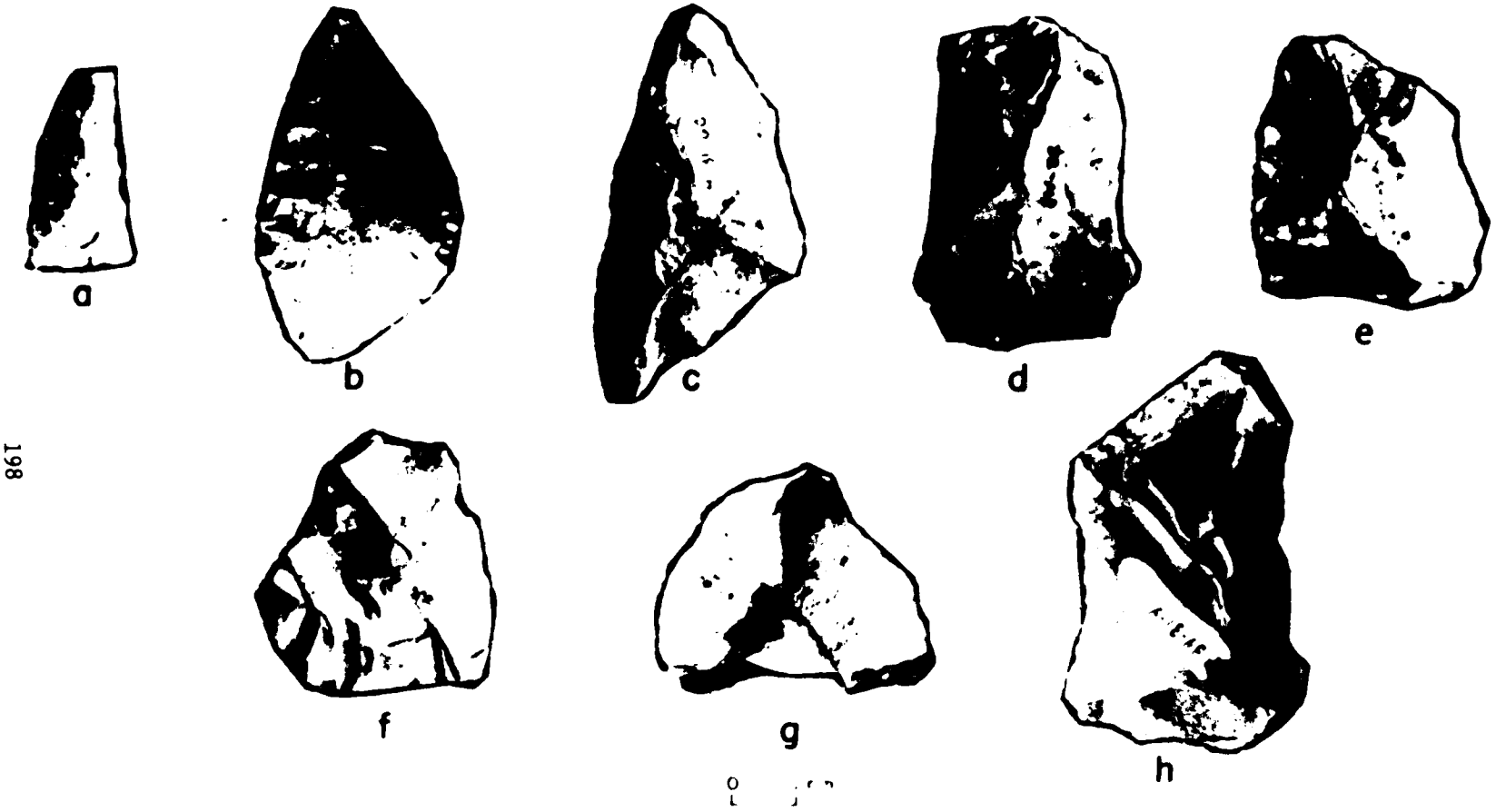

Plate 31. 3CW7 Shelter 2 chipped stone artifact examples collected in 1934. (a) Hamilton or Madison arrowhead, (b-c) bifaces, (d-h) modified flakes. Full scale.

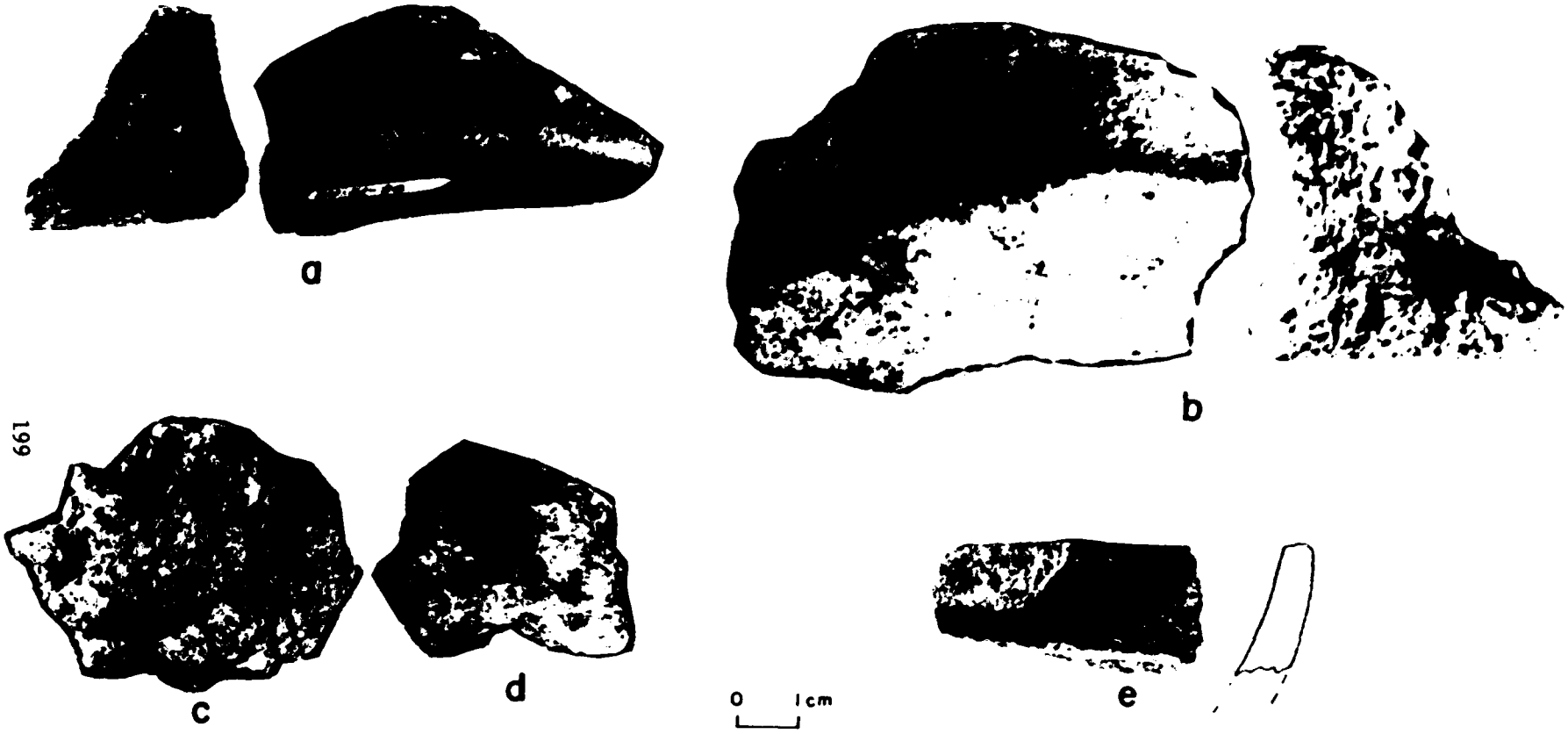

Plate 32. 3CW7 Shelter 2 ceramic examples. (a-b) Williams Plain "defined stilt" base, (c-d) grog tempered clay masses (e) Woodward Plain "thinned flat" rim. Full scale.

Plate 33. 3CW7 Shelter 2 Type CFWB2-2 weaving example collected in 1934. Half scale.

Plate 34. 3CW7 Shelter 2 weaving examples collected in 1934. (a) Type CFWB5, (b) rim form "J:, (c) Type CFWB2-b. Half scale.

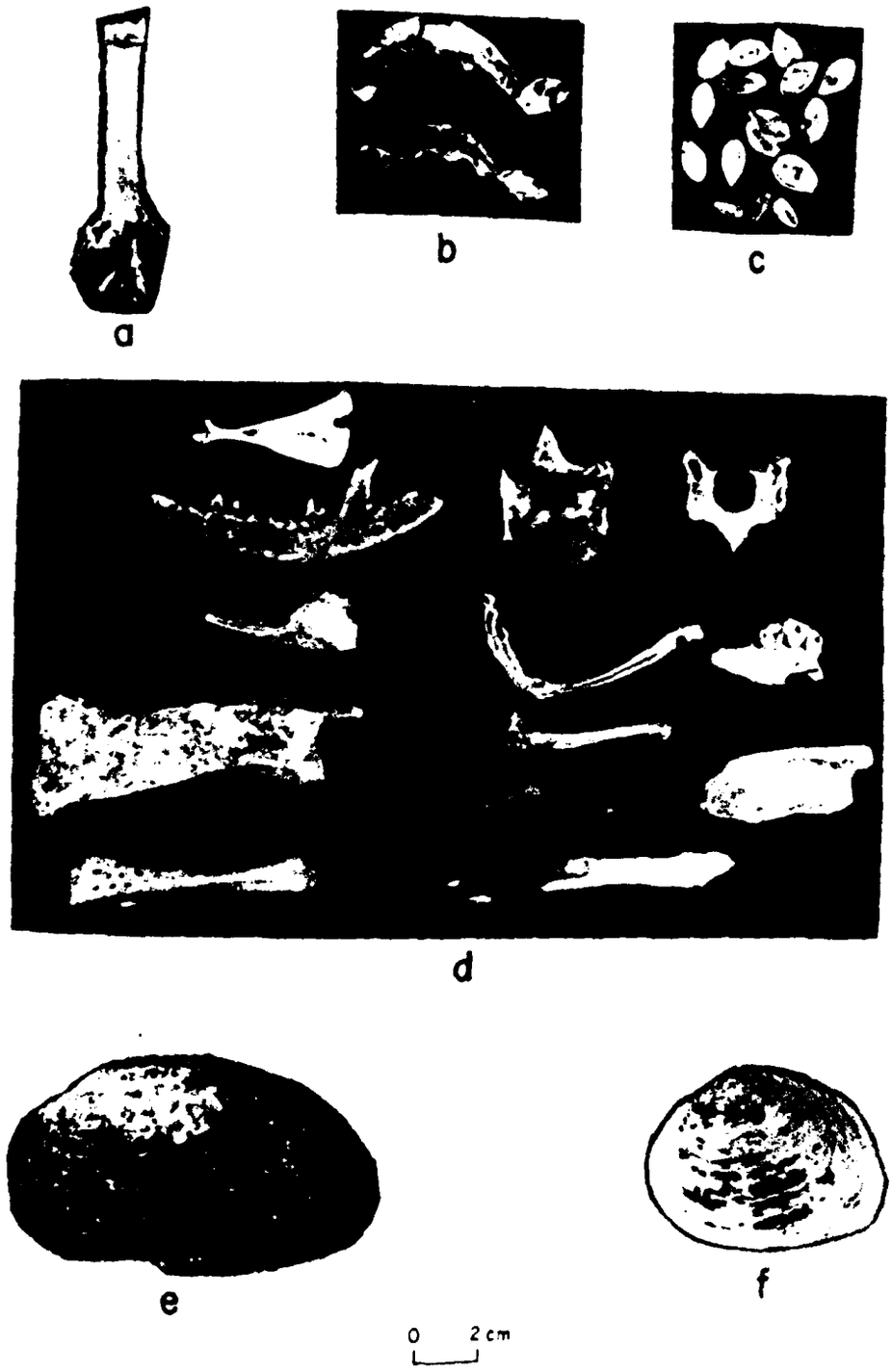

Plate 35. 3CW7 Shelter 2 floral and faunal food remains examples collected in 1934. (a) corn stalk, (b) beans, (c) pumpkin or squash and sunflower seeds, (d) animal bones, (e-f) mussel shell. Half scale.

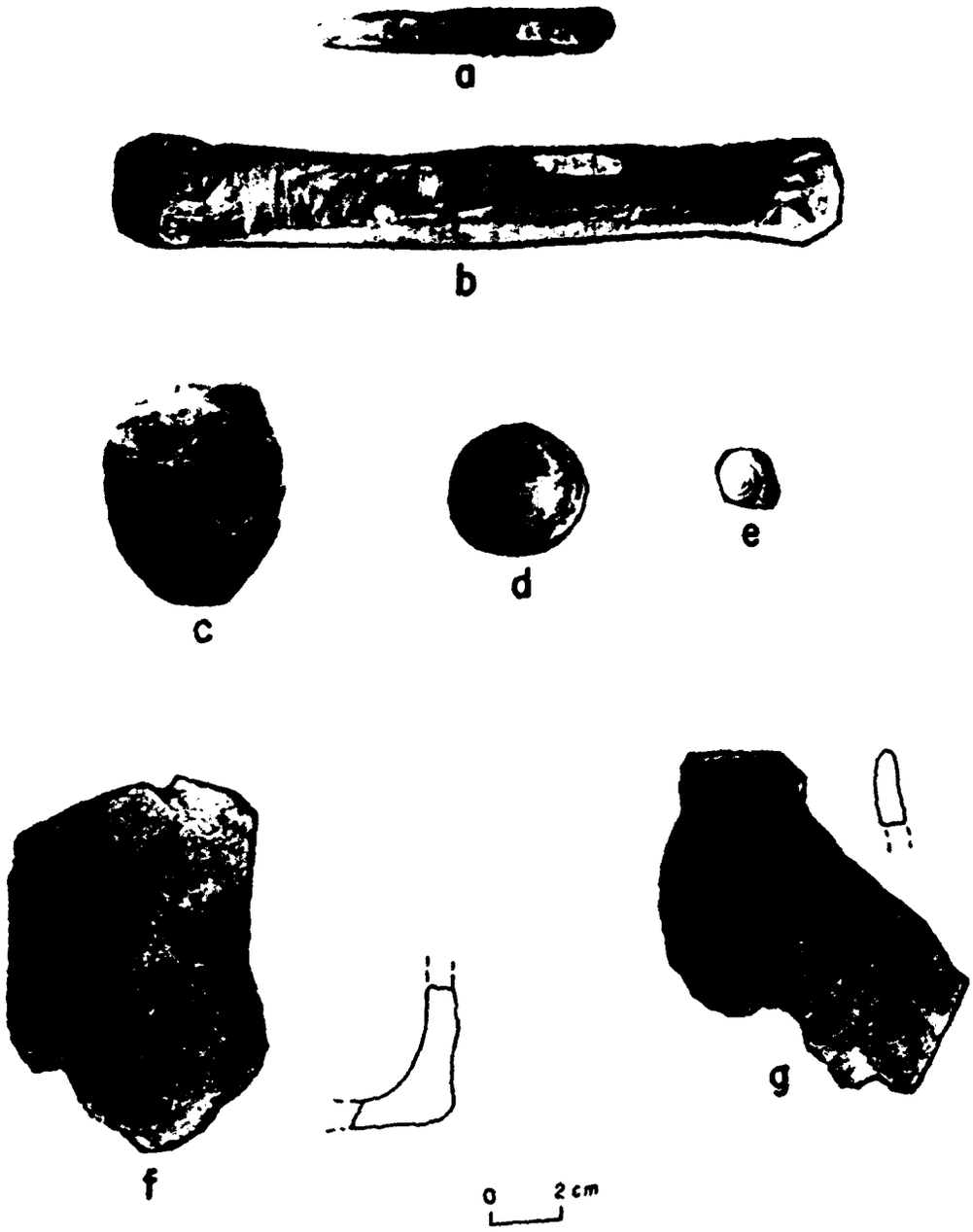

Plate 36. 3CW7 Shelter 3 examples of artifacts. (a) bone tool, (b) bear (?) radius, (c) biface, (d) mussel shell, (e) snail shell, (f) Poteau Plain "rounded undefined" base, (g) Poteau Plain "rounded" rim. Half scale.

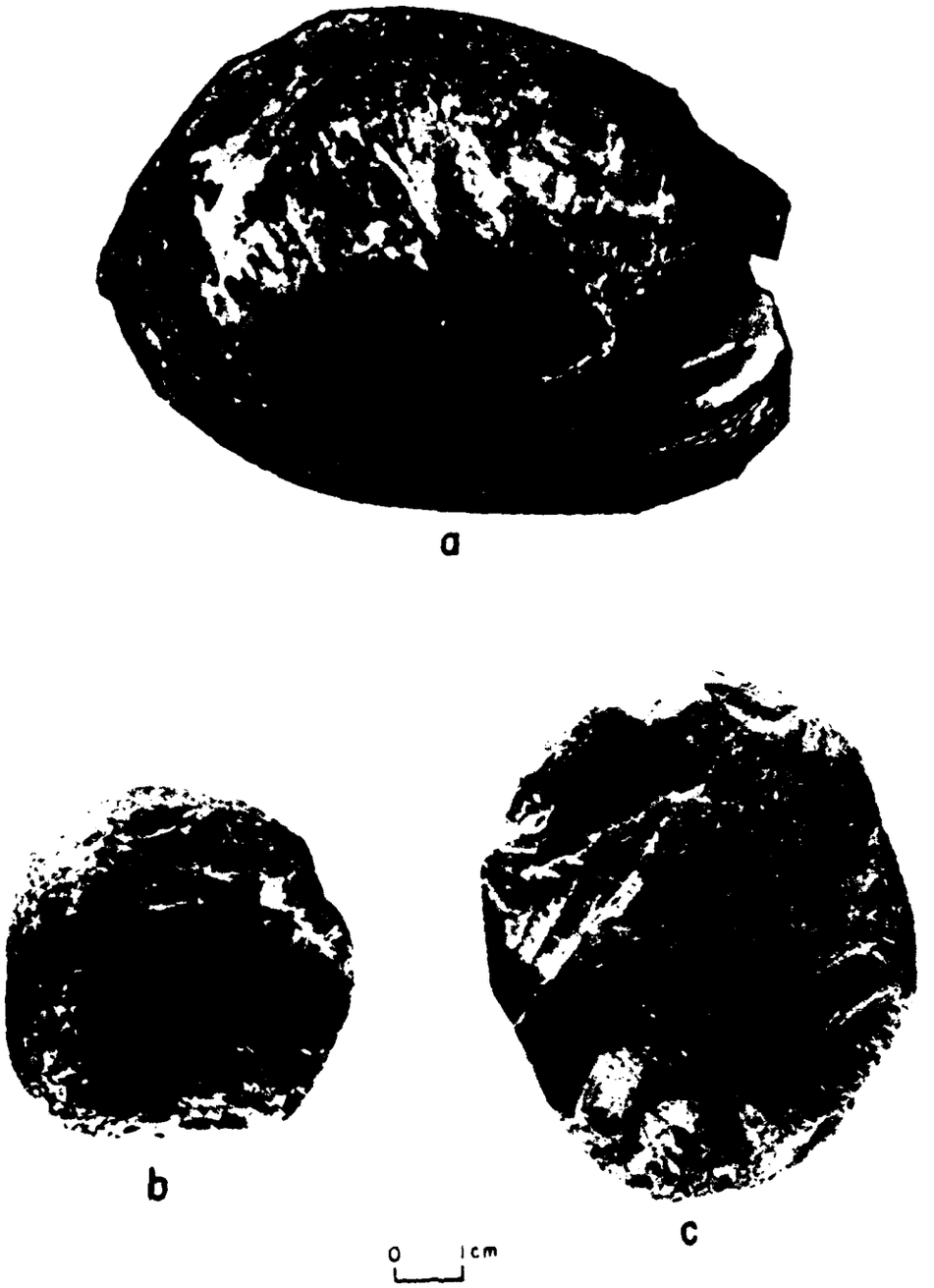

Plate 37. 3CW69 examples of artifacts recovered in 1934. (a) shell hoe, (b-c) Pitkin chert cobble hammerstones. Full scale.

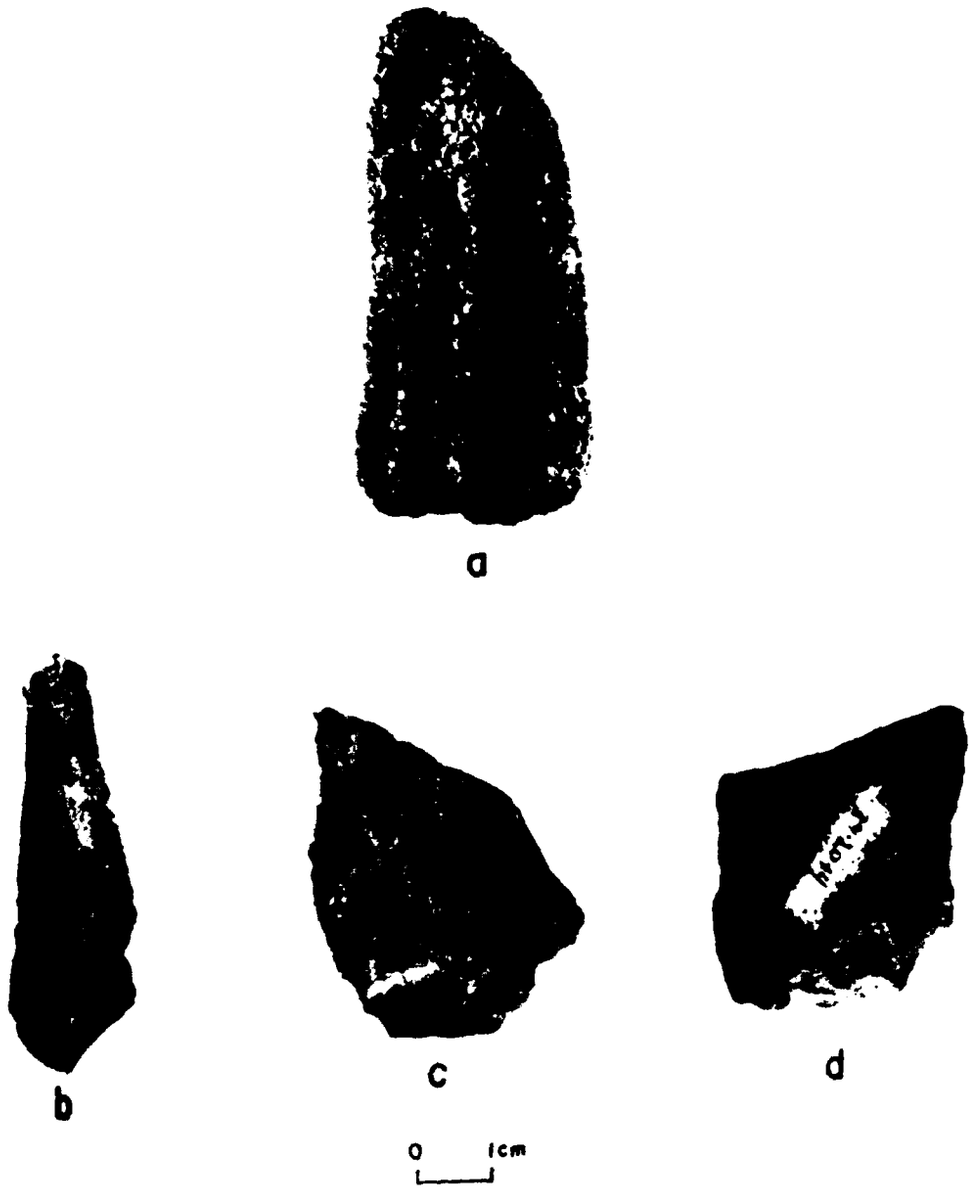

Plate 38. 3CW69 examples of artifacts recovered in 1934. (a) sandstone abrader, (b-c) Boone chert modified flakes, (d) Type I siltstone biface haft. Full scale.

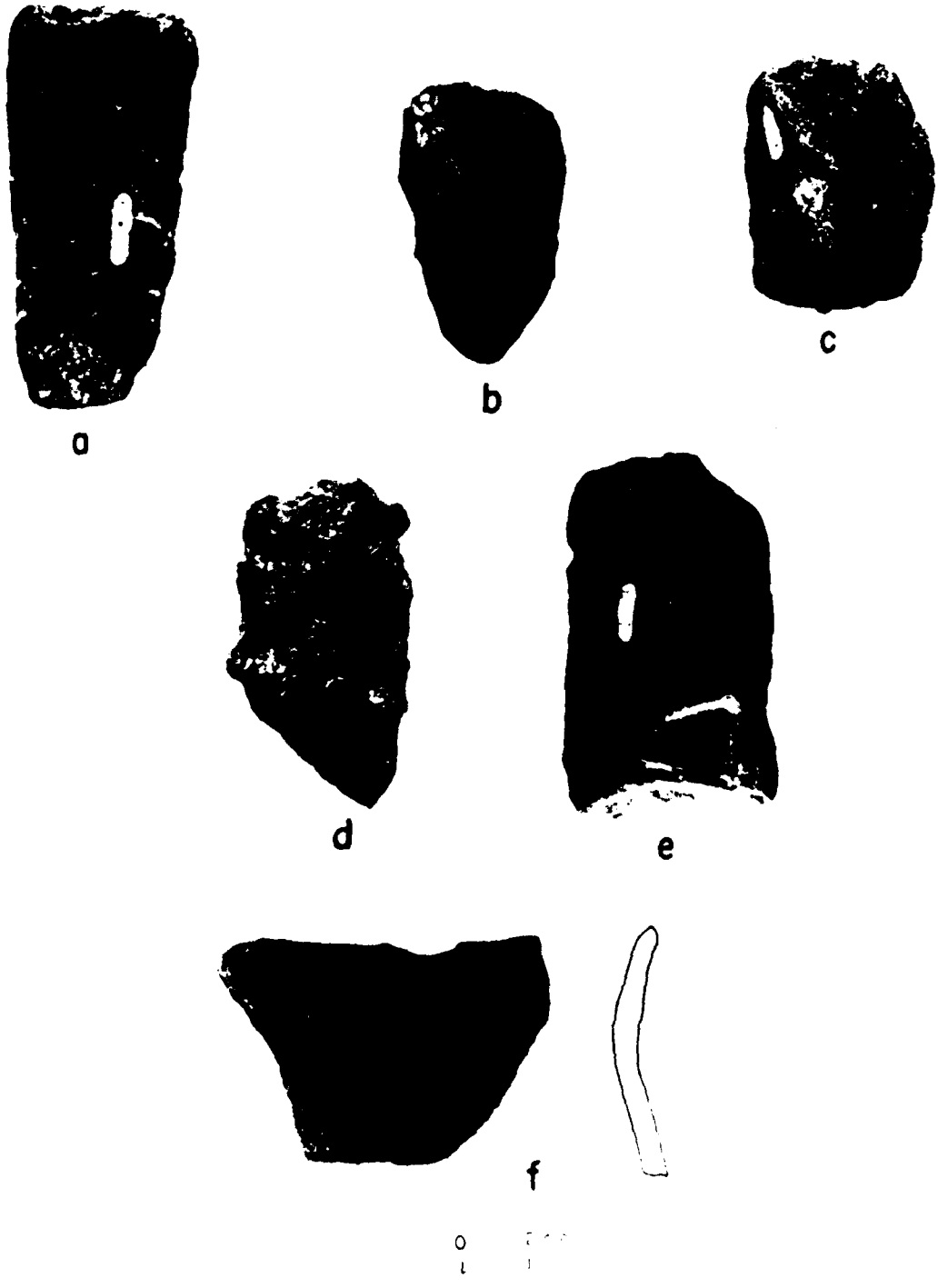

Plate 39. 3CW69 examples of siltstone and ceramic tools. (a,d-e) Type IV siltstone bifaces, (b) Type II or IV siltstone biface, (c) Type III siltstone biface, (f) Woodward Plain "direct rounded" rim. Half scale.

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Appendix 1

Further Notes on Cane Basketry Techniques from Ozark Shelters

by

Sandra Clements Scholtz

In the late 1960s, I analyzed the Ozark bluff shelter basketry, cordage, and textile remains that were in the collections of the University of Arkansas Museum. This analysis was later published in the Research Series of the Arkansas Archeological Survey (Scholtz 1975). The collections which were analyzed at that time were collected 40 to 50 years ago under the direction of Mr. Sam Dellinger. During the intervening period, the perishable materials were housed with the museum collections, frequently in their original boxes and paper bags, and were moved with the museum collections several times.

Shortly after my analysis was completed the museum collections from the 1930 era were reorganized into standard storage boxes. During the reorganization of the materials, a few items were found that had not been included in my study. They were placed with the materials from the sites from which they were excavated. In the present study of the Pine Mountain area, the older museum collections were incorporated into the analysis. During the process of describing the older material, I discovered a few items which were not included in my study. These items included a type of weave and a type of rim form which are different from any which were represented in my original analysis. Since these items represent valuable information concerning the variation of prehistoric Ozark basketry techniques, the decision was made to include their description as an appendix to the Pine Mountain report. Both of the items described below are from the Swearingen Farm Bluffs, designated as site 3CW7.

RIM FORM J

The item on which this rim form appears is identified as SW-56 (Plate 34b). It is a 7.8 cm section of an edge from an item in which the weave is oblique to the selvage. The opposite dimension of the piece is 3.9 cm. The elements are cane splints which measure about 0.5 to 0.6 cm in width.

In this item the approach to the selvage of each element is oblique, and at the selvage each element is bent 90° and reentered into the weave, still obliquely to the selvage. When the weave of the item is viewed from either surface, one set of elements is oriented with the smooth surfaces of the cane splints up while the other set is oriented in the opposite direction. The constructional features of this selvage are very similar to those of Rim Form I, described in the earlier analysis (Scholtz 1975; Figure 71c and d and Figure 72). There are two differences between the two rim forms. In Rim Form I the elements are bent 90° but before reentering the weave, are twisted to maintain the smooth surface orientation. The second difference is that in Rim Form I there is a cane splint, positioned parallel to the selvage, around which the elements are bent. This splint forms an inner core of the selvage of Rim Form I but is not present in Rim Form J.

There is not enough remaining of the item identified as SW-56 to allow identification of the basic weave structure or of the original shape or form of the item. The piece was found in association with the remains of a human burial and may represent the remains of a mat on which the burial was placed.

CFWB5

This item (Plate 34a), identified as SW but with no identifying number, represents a fifth type of complicated float weave basketry to be identified from the Ozark area. This basic weave structure is designated CFWB5. A complicated float weave structure (Scholtz 1979: 78-87) is defined as a form of interlacing in which the two sets of elements are employed differently, i.e., the warp and the weft require different numerical notations. The notations for the new type of complicated float weave basketry being defined on the basis of the Swearingen item is 2/4&4/2:2/1. In this weave the elements of one set interlace over two and under four elements of the opposite set. Elements in the opposite set alternate in their weaving pattern. Every other element interlaces over four and under two, while alternating elements interlace over two and under one.

This item measures about 16 by 13 cm and is constructed of cane splints which are .04 to 0.45 cm in width. The set of elements which interlace over two, under four are oriented with the smooth surfaces of the cane toward one surface of the item, while the other set of

elements are oriented in the opposite direction. There is not enough remaining of this item to determine its original shape or form.

DISCUSSION

The rim form and weave described here for the first time show general similarities to a rim form (I) and other complicated float weaves described in my earlier study. Also included there are detailed comparisons of those techniques with both prehistoric and historic items of a similar nature. The reader is referred to those comparisons for a discussion of the temporal and spatial distributions of oblique rims and complicated float weaves.

Appendix 2

Scope of Services and Proposal
for 1979 Pine Mountain Research

APPENDIX A
CULTURAL RESOURCE INTENSIVE TESTING
OF SELECTED SITES
PINE MOUNTAIN LAKE
LEE CREEK, ARKANSAS

1. General. The contractor shall furnish all materials, equipment, supplies, labor, transportation, and services required to conduct a cultural resource survey on unsurveyed lands and intensive testing on specific sites.

2. Scope of Services.

a. The contractor shall conduct an intensive survey on those unsurveyed lands identified in the contract report.[1]

All sites located will be plotted on applicable USGS quad sheets, one set of which will be provided the Government at the time the report is submitted. No exact site locations will be displayed in the main report. Arkansas Archeological Survey site sheets shall be completed on any new sites located. Each site will be described in the report by a separate paragraph.

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[1] Raab. L. Mark, Pine Mountain: A Study of Prehistoric Human Ecology in the Arkansas Ozarks, Arkansas Archeological Survey, 1976, p. 47.

b. Testing to determine significance and eligibility of sites for nomination to the National Register will be conducted on the following sites:[2] (Sites 3CW69, 3CW6, and 3CW7 will first have to be relocated.)

3CW110	3CW69
3CW116	3CW6
3CW119	3CW7
3CW127	

National Register nomination forms will be completed for sites appearing to be eligible for the register. Areal extent and depth will be given on each site. All holes will be refilled and the terrain restored, as close as practicable, to natural conditions. Procedures used to collect and evaluate information on all sites will be described in sufficient detail to allow for adequate review and critique of the investigations and assessments. This will include:

(1) The kinds of cultural resources present or inferred to be present and an estimate of regional distribution relationships thereof;

(2) The effects of loss of all or parts of the resources upon future investigations or appreciation of cultural values;

(3) A discussion of the public or scientific value of the testing.

[2] Arkansas Archeological Survey assigned numbers.

c. Recommendations for interpretive displays, other than a display at the resident office, will be furnished, if appropriate.

d. The report shall briefly summarize the previous investigation.

e. A summary of the findings and recommendations will be included in a section at the beginning of the report.

3. Right-of-Entry. The Corps of Engineers will furnish the rights-of-entry to conduct the work.

4. Coordination. The contractor shall be responsible for coordination with local, State, and Federal agencies as needed. The contractor shall be available throughout the contract period for consultation with the contracting officer or his authorized representative. The State Historic Preservation Officer will be consulted to identify properties on the National or State Registers of Historic Places.

5. Personnel. The principal investigator will have a graduate degree in archeology, anthropology, or a closely related field, or equivalent training accepted for accreditation purposes by the Society of Professional Archeologists and the following:

a. At least 16 months of professional experience or specialized training in archeology field, laboratory, or library research, including at least 4 months of experience in general North American archeology and at least 6 months of field experience in a supervisory role.

b. A demonstrated ability to carry research to completion, usually evidenced by timely completion of a thesis, research reports, or similar documents.

c. For that part of the work concerned with prehistoric archeology, at least 1 year's experience in research concerning archeological resources of the prehistoric period.

d. For the part of the work concerned with historic archeology, at least 1 year's experience in research concerning archeological resources of the historic period.

The principal investigator will be responsible for accuracy and completeness of the information contained in the contract report.

6. Format. The report shall be in a narrative form following an order that can be easily read and understood. Each cultural site shall be

described in a separate paragraph. Photographs are encouraged when, in the opinion of the contractor, a better knowledge of the site will be presented to the reader. The typed final report shall be single-spaced with format size approved by the contracting officer. The final report shall consist of the original text, art work, maps, and photographs. Binding edge dimensions of all tables and maps presented in the report shall conform to report format size and map title blocks will be visible when folded. The contractor shall submit to the Government five copies of draft text of the report for review and comment. Only one copy each of photographic prints will be required for the draft. Comments resulting from the review shall be furnished to the contractor for incorporation into the final report unless deletion is agreed to by the Government. The contractor shall submit one copy of the final report including art work, maps, and photographs suitable for reproduction.

7. Materials Furnished by the Government.

a. The Government shall furnish appropriate maps, drawings, and related engineering data, detailing the damsite and impoundment area.

b. The Government will furnish the contractor an appropriate number of copies of the final reproduced report for coordination with other interested agencies and environmental groups.

8. Disposition of Materials collected. Materials collected will be deposited in an Arkansas depository approved by the Government and the State Archeologist. Materials will be properly curated by acceptable scientific standards such that they can be easily recalled for scientific study and additional analysis. These materials which belong to the U.S. Government will be available to the Corps upon request.

9. Schedule of Work. The contract work shall be completed in accordance with the following schedule.

a. All field work shall be completed within 105 calendar days after receipt by the contractor of the notice to proceed.

b. Five copies of the draft report shall be submitted within 195 calendar days after the receipt by the contractor of the notice to proceed.

c. The Government review of the report shall be completed and returned to the contractor within 45 calendar days.

d. One copy of the final report suitable for reproduction shall be submitted 30 days after receipt of the Government's comments. Reproduction of the required number of copies will be accomplished by the Government.

e. All work and services required by this contract shall be completed within 270 calendar days after receipt by the contractor of written notice to proceed with the work.

PROPOSAL FOR CULTURAL RESOURCE SURVEY, TESTING, AND EVALUATION OF SELECTED AREAS AND SITES IN THE PROPOSED PINE MOUNTAIN LAKE, LEE CREEK CRAWFORD COUNTY, ARKANSAS

Submitted to: Little Rock District
U.S. Army Corps of Engineers
P.O. Box 867
Little Rock, Arkansas 72203

Submitted by: Arkansas Archeological Survey
Coordinating Office
University of Arkansas Museum
Fayetteville, Arkansas 72701

June 11, 1979
Revised July 11, 1979

INTRODUCTION

On 29 May 1979, at the request of the Little Rock District, U.S. Army Corps of Engineers, the Arkansas Archeological Survey was invited to submit a proposal responsive to an Appendix A calling for cultural resource survey, testing, and evaluation of selected sites in the proposed Pine Mountain Lake, Lee Creek, (Crawford County) Arkansas. The Arkansas Archeological Survey has considered the Scope of Services and letter of modification (dated 7/9/79) and hereby proposes to perform the work in the following manner.

To accomplish this project within the required time frame, the work will be carried out by a field team and a laboratory team, each handling various project tasks. Reconnaissance, site testing and laboratory projects will be carried out in an overlapping and concurrent fashion (Figure 1). The project will consist of three major areas of activity: fieldwork, concurrent laboratory processing, and a period of report preparation. All of these tasks will be carried out under the direct supervision of the Project Archeologist, assisted by the Assistant Project Archeologist who will serve as Crew Chief for the field phase and Data Analyst for the writeup and analysis phase. These positions are budgeted for 110 man days and the archeologists will be involved directly in all field and laboratory activities enumerated below in Tasks 1 and 2. The Principal Investigator and Contract Administrator will direct and advise the Project Archeologists in such a manner as to complete the project in a timely and competent fashion. Both a Historian and Historical Archeologist are budgeted for the equivalent of a week each to assist in cultural identifications, and

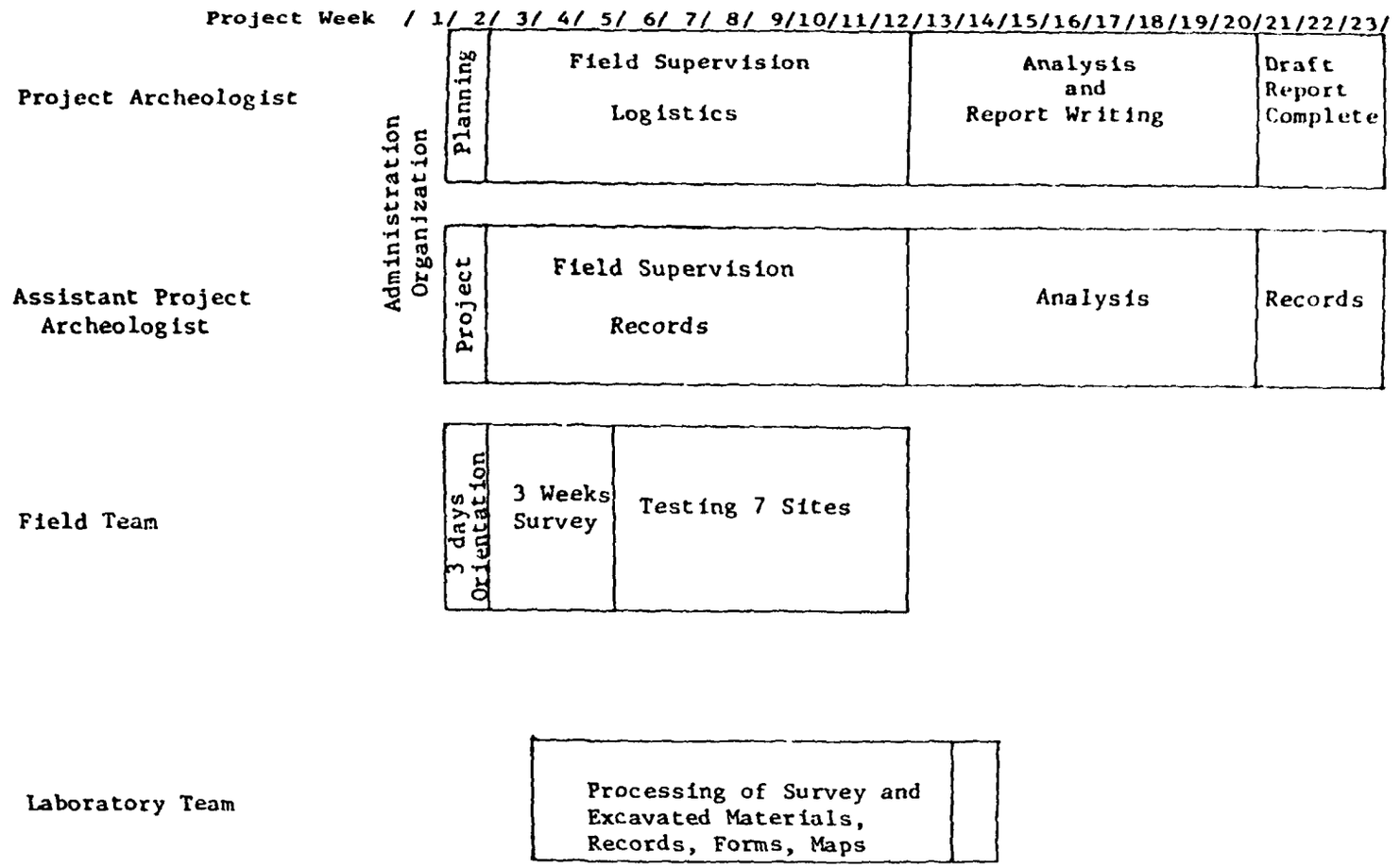
Project Week / 1/ 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/
Project Archeologist
Planning
Field Supervision
Logistics
Analysis
and
Report Writing
Draft
Report
Complete
Administration
Organization
Assistant Project
Archeologist
Project
Field Supervision
Records
Analysis
Records
Field Team
3 days
Orientation
3 Weeks
Survey
Testing 7 Sites
Laboratory Team
Processing of Survey and
Excavated Materials,
Records, Forms, Maps

Figure 1.

to do additional background research needed for the project. Two basic field projects required by the Scope of Services are discussed below.

TASK 1. COMPLETION OF SITE RECONNAISSANCE

Two lowland areas remain to be surveyed within the project boundary. These could not be investigated previously due to denial of access by the landowners (Raab 1976); now the Corps of Engineers has indicated that they will obtain the necessary permission prior to fieldwork. Several upland areas also require investigation to relocate three of the rock shelters studied by Dellinger in the 1930s (3CW6, 3CW7, and 3CW69).

The lowland areas (designated A and B: Figure 2) each cover an area of about 110 acres of woods, pasture, and cropland. The major portion of these areas is overgrown and will offer poor visibility. The original reconnaissance party was generally unable to locate sites in such overgrown areas (Raab 1976:47).

It has been domonstrated that in old fields and pastures plowing can be a more economical and reliable method of site reconnaissance than small test procedures such as shovel holes or auger borings (Trubowitz 1975). Assuming that the Corps of Engineers can obtain appropriate permission, cultivation equipment will be hired, and suitable portions of the lowland areas will be plowed to search systematically for cultural remains that might be in the plowzone. Areas that cannot be plowed will be surface inspected with limited test procedures used as appropriate.

Based on Raab's previous research, the density of prehistoric sites in the lowland is calculated to be about one site for every 25 acres. However, this estimate is biased as it only reflects site locations found

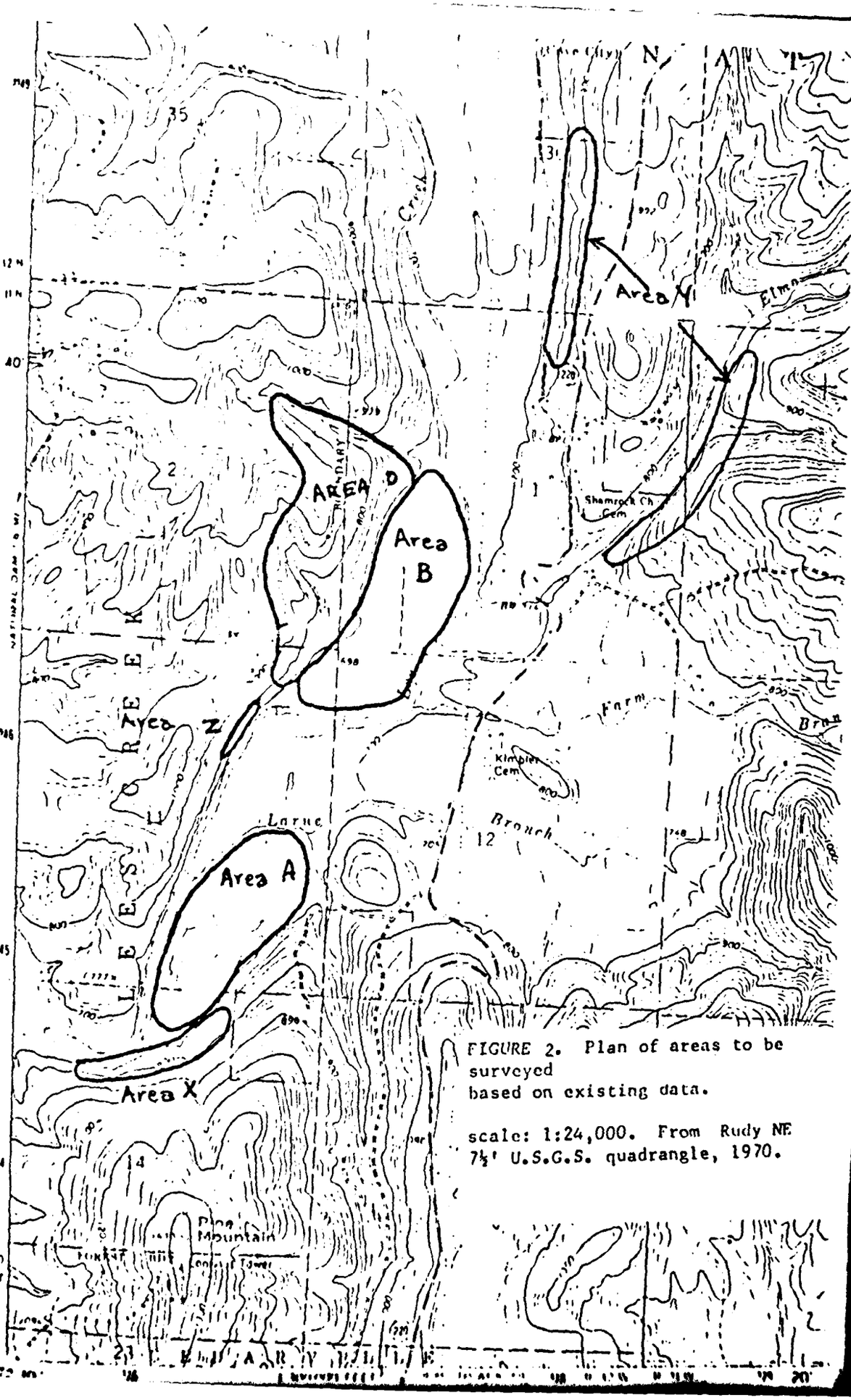

FIGURE 2. Plan of areas to be surveyed based on existing data.

scale: 1:24,000. From Rudy NE 7½' U.S.G.S. quadrangle, 1970.

in exposed surface areas. In addition to locating new sites, the plowing techniques of reconnaissance would provide a test of the reliability of the previous survey results and facilitate estimation of regional site distributions.

Three upland areas will be inspected to relocate the Dellinger shelters. The vicinity of the locations of one of the sites, 3CW7, was designated as area D by Raab. Further study of existing notes and photographic records will be required before the locations of 3CW6 and 3CW69 can be approximated, but their supposed general locations are shown as Areas X and Y on the attached map. The bluffs in these areas will be searched for shelter overhangs.

The total area of uplands and lowlands to be surveyed is calculated at ca. 375 acres. Given expected field conditions, a maximum of 15 field days for the survey crew will be required to complete the reconnaissance. Daily area coverage will vary depending on the vegetation cover, however, we estimate that in overgrown areas that must be shovel tested, approximately 25 acres a day can be covered by a crew. In cultivated areas there might be concommitant delays waiting for the plowing to be completed; therefore, for the budget computations, 25 acres per day was used for the entire survey area. Though overgrown areas can be shovel tested and covered by transect walking, we estimate that the reliability of such a survey is less than a 10% level of confidence in the results being representative of site density in any overgrown area. Intensive investigations in plowed areas with unobscured surfaces is estimated to produce 90% of the site locations in a given area that have remains in the plowzone (Trubowitz 1975:7, copy attached).

Based on data in hand, which is biased as noted above, it is expected that the lowland reconnaissance will reveal about ten new prehistoric site locations. Background documentary research may reveal additional historic site locations in the lowlands. Based on existing data, seven additional sites may be found in the upland survey.

TASK 2. TESTING OF PREVIOUSLY RECORDED SITES

Seven previously recorded sites are to be tested. As noted above, three are shelters worked on by Dellinger in the 1930s (3CW6, 3CW7, and 3CW69). The other four sites are large lowland occupations (3CW110, 3CW116, 3CW119, and 3CW127). For a description of the sites see Raab (1976:36-37). 3CW6 consists of two separate overhangs; 3CW7 may be four separate shelters; 3CW69 is a 46 feet long series of overhangs.

The sites will be tested in order to seek data that will: define the horizontal and vertical site limits, determine what kinds of cultural remains are extant, define the integrity of the cultural deposits, determine cultural affiliation and function of the sites, and assess their potential significance for eligibility determinations for the National Register of Historic Places.

The relocated "Dellinger" sites will be tested with from one to several small test excavation units, depending on the size of the shelters or number of overhangs. An average of five working days per site area is all that has been budgeted due to fiscal constraints. Maximum test size will probably not exceed 1 x 2 m in surface configuration. All of the shelters consist of at least two overhangs, each of which should be tested if they are large enough for occupation. The size and placement of the

test units will largely be determined by size of the overhangs and the nature of rockfalls at the sites. Only smaller slabs will be able to be moved for access to potentially undisturbed deposits; it is unlikely that any of the shelters will have been totally missed by pothunters. All dirt will be screened from the tests and soil, C-14, and flotation samples will be collected where appropriate.

If possible, test units will be put both inside the shelters and on the talus slopes in front of them to search for cultural remains. The depth of the deposits is expected to vary widely depending on the geology of the shelter and the length of occupation. The shelters will be mapped to show the location of tests and the structure of the shelter.

It is expected that access to the shelters will be limited by the rough terrain they overlook, and their location away from modern roads.

The four large lowland sites were recorded from surface remains (Raab 1976). At present there is no firm data on their actual horizontal extent, and no data is available on their depth. Small test holes and/or plowing may be needed to delimit the horizontal extent of the sites if they go beyond presently cultivated areas. Surface collections will be mapped with a transit to delimit the site and define activity areas or middens.

Test excavations aimed at determining site depth, integrity, artifact content, and the presence or absence of features will be concentrated in areas of high artifact densities or specific topographic features that are most likely to produce the desired data. Maximum individual test excavation size will probably be a 1 x 2 m trench, although the discovery

of any deposits deeper than 2 m might require opening the test to a larger size. Test procedures will be as noted for the rock shelters. The test schedule will permit opening three test units at most on each large site. Total time spent on any single large site for tests is anticipated to average four to five days for the field crew.

The site tests will provide the data required in the Scope of Services on content and size, and information as to whether any of the research questions posed by Raab can be pursued using the data available on the sites. The sites will be evaluated in terms of their potential to answer questions about hunting and gathering behavior including fall-winter deer hunting and spring-summer agricultural subsystems of adaptation to the natural environment. Data from shelter sites will be applicable to the former, and the lowland sites may provide information on the latter research question. The shelter sites could provide data on chronology through the recovery of C-14 samples. Radiocarbon samples and floodplain stratigraphy may also contribute to research into chronology. Artifact recovery will detail whether the sites are suited to studies of aboriginal technologies and activities. These data will provide the information necessary to determine the potential significance of the sites for the National Register criteria of eligibility.

TESTING OF NEW SITES

As noted under Task 1, it is anticipated that 17 additional sites will be discovered in the reconnaissance area remaining for the project. On the lowlands, ten sites may be discovered and another seven sites are expected to be found in the uplands while searching for the three

Dellinger rock shelters that are to be tested. Although the original Scope of Services called for testing for significance to be carried out on newly recorded sites, time and budgetary considerations preclude such action under this proposal. If, however, the number of newly recorded sites falls far lower than our prediction, and therefore can be tested with a minimal increase to the budget, the Corps of Engineers Contracting Officer's Representative will be notified so that a field conference may be held to determine the best action to take within the constraints of the negotiated contract, and whether supplemental work or an amendment to the contract with additional funding may be required.

FIELD SCHEDULE

All aspects of fieldwork will be completed within 105 calendar days after receipt of the Notice to Proceed (Figure 1). Organizational aspects of the project are portrayed in Figure 3.

The project schedule assumes that significant field delays will not be caused by adverse weather conditions or other factors beyond the control of the Arkansas Archeological Survey. If such conditions do arise the Corps of Engineers Contracting Officer or his representative will immediately be contacted and an appropriate adjustment in the project time schedule will be made.

ANALYSIS AND REPORT SCHEDULE

All analyses and a draft report will be completed within 195 calendar days of the Notice to Proceed. Five copies of the draft report will be submitted for review by the Government (Army Corps of Engineers, Little

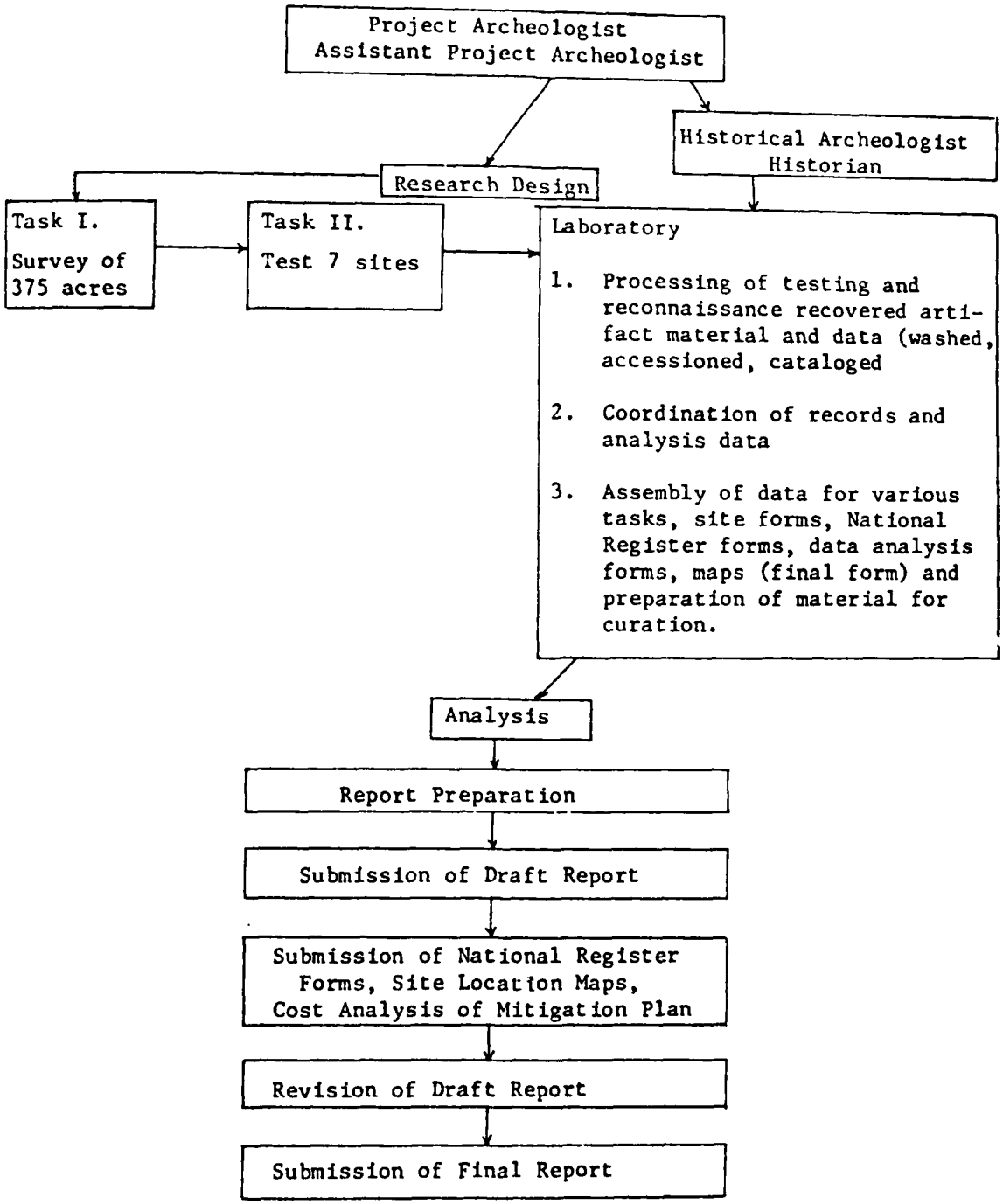

Figure 3. Project Research Tasks.

Rock District). The Government's review of the draft report will be completed in 45 calendar days and one copy of the final report, suitable for reproduction and prepared in format to governmental specification, will be submitted within 30 days after the receipt of the Government's comments. All work and services required by the contract will be completed within 270 calendar days after the Arkansas Archeological Survey receives Notice to Proceed with the contract.

Budgetary Justifications

The Project Archeologist will be responsible for the daily operations of this project and will write the draft report. The Project Archeologist will spend 5 days in prefield planning, ca. 50 days in the field and 55 days in analysis, report writing and review (154 calendar days). This position is budgeted at the rank of Assistant Archeologist requiring a Ph.D. degree or equivalent experience for this position. This individual will operate under the general supervision of the Principal Investigator.

The Project Archeologist will be aided by an Assistant Project Archeologist who shall serve as Crew Chief in the field and serve as Data Analyst during the analysis and writeup period. This position is staffed at the rank of an Archeological Field Assistant II. Three field crew positions have been budgeted to conduct the various tasks to be carried out within the time frame of the project. These individuals will be paid at the wage scale set by the personnel system of the state of Arkansas. In addition, various specialized laboratory, technical, and support personnel have been budgeted to accomplish requisite aspects of the project. One laboratory assistant more than field assistants has been

calculated in the budget. This person also shall aid the Project Archeologist in preparation of National Register forms for the tested sites.

Indirect Costs and Fringe Benefits

These percentages are set for the Arkansas Archeological Survey by the National Science Foundation. Audits by the Vicksburg District, U.S. Army Corps of Engineers, and by various other governmental agencies substatiated the NSF rates.

Travel

Appropriate field vehicles will be assigned to the project. Centralization of crew quarters and daily travel to and from the field have been taken into account in computing the mileage estimate. Archeological materials will be processed in the Archeological Survey Laboratory in Fayetteville and will be transported there periodically.

Per Diem

State maximum for reimbursement of food and lodging expenses is limited to $35.00/day per individual. However, to reduce costs, we plan to provide rented living facilities for the supervisor and crew in the immediate project area (lodging for 3 mo. @ $750.00/mo.) and a meal allowance of $15.00/day for the supervisor and crew members. A total of $5250.00 has been budgeted for lodging and subsistence for support personnel. Sixty days at $35.00 per diem have been budgeted for the Project Archeologist and historical consultants.

Expendable Supplies

Expendable supplies for fieldwork and laboratory processing are included as well as cost of film and purchase of other specialized material. These have been calculated on an estimated cost per field or laboratory day.

Report Preparation

This estimate includes the cost of multiple draft report copies and the production of any special graphic layouts for the final draft report.

Constraints

The Corps will obtain all landowner permissions for access and the types of investigations that will be required (plowing, test excavations). It is suggested that landowners be presented with the opportunity to be paid to assist the survey crew with plowing and reseeding their own property before an outside party is hired to do such work. Local assistance will have to be obtained as there is little likelihood of finding qualified persons to come from outside the Lee Creek area to do the plowing.

Consultants

Dr. L. Mark Raab, director of the original project, will be retained to consult on the findings of the investigation for comparison with his investigations in the area. A palynologist may be needed to assess soil samples for the presence of pollen. Radiocarbon assaying may be needed if appropriate samples are recovered. A total of $750.00 is budgeted for various consultants or contractual services.

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